No. 33.

Field Book

of

W. L. Jepson

If lost finder please return to
W. L. Jepson, Department of
Botany, University of California,
Berkeley, California, and
Receive Reward.
It is valuable only to the
owner.

University of California
1916

Berkeley, May 29, 1916.

— The white outcroppings on Howell Mt. are noticeable to the traveler. Arctostaphylos stanfordiana does not grow away from their immediate vicinity— I think. I sent a specimen of the white rock to Eakle who replies that it is "a clay derived from a volcanic tuff, I should judge. It has a little chloride in it." See No. 6586.

— Lycium pallidum Miers, No. 6606. This, the common sp. in the heart of the Mohave, has been affected by a blight— all the leaves blackening and falling away. The disease was general over the areas, but none other of the species was touched by it. So reports Miss Waterman of Barstow. This epidemic occurred since my departure from Barstow.— This note recorded July 21, 1916.

Mt Tamalpais

No. 6802. Arctostaphylos glandulosa, Eastw. 2 to 4 ft. h. This forms by far the greater portion of the Manzanita cover on Mt. Tamalpais I should say. It seems a very shy bearer. Berries whitish until near maturity. Foliage dull medium green.

No. 6803. Arctostaphylos canescens, Eastw. 3 ft. h. Bark of this splitting irregularly and releasing the loose meal. This seems uncommon however. Foliage white green.

No. 6804. Arctostaphylos glandulosa, Eastw. On ridge near Rock Spring. Bunchy

buds of stems seem more glandular than in shrubs on slope down down. The foliage is thick and characteristically bunchy at or towards ends of branches in this species. [This seems more like A. nigata Eastw. — W.L.J. Mar. 1920].

No. 6805. Cupressus sargenti. Bark dark or almost black. fissured lightly longitudinally. Shrubs but in form = small trees

	Diam at 4 in.	Ht.
Tree No 1. -	7¼ in.	9
" " 2 -	8 in.	8
" " 3 -	3 in.	10

The branches are pointed or finger-tipped, the habit rather open and somewhat irregular, like pygmy trees as if mimicing the Big Monterey

Mt. Tamalpais Marin Co.

Cypress. The colony occurs on the ridge of Tamalpais, halfway to Rock Spring, a colony set in the chaparral of Arctostaphylos glandulosa, a montana, Pickeringia montana, Adenostoma fasciculatum & Quercus dumosa.

Diam at 4½ ft.

Tree no. 4 – 1 ft. 6 in – 22 ft.
" " 5 – 1 ft. 8 in – 18 ft.

Tree no. 5 branches within one ft. of base and the diam. is the largest diam. See p. 8

– Arctostaphylos pumila, in fl! Doubtless in flower or to be found in fl. any month in year.

– Aralia californica is a fine plant. 6 to 8 feet tall,

its fine handsome luxuriant foliage and slender flower-crowned stalks make it an ornament to the stream-bottoms of the woods. It is now in flower.

– No. 6806. Arctostaphylos montana, Eastw. Well-grown bushes 3 ft. high well laden with berries, rather more abundant than in case of any other species. The berries are smaller than those of A. glandulosa. This is the rarest species on the mountain. The berries are whitish with scarcely a pink or ruddy tinge, roundish but noticeably longer than thick. When half grown they appear flattened & compressed, and as being longer than thick this compression gives them a peculiar appearance. On

Mt. Tamalpais

the other hand somewhat depressed-globose berries are found on same bush!! Shape is therefore quite variable, and rather markedly eccentric.

No. 6807. Psoralea macrostachya = P. douglasii Greene, not macrophylla. Stream bottoms of canons. 8 ft. tall. A fine plant. Corolla parts subequal, 5 lines long. Tips of wings + middle of banner purple, the reflexed sides of banner except at tip whitish. Banner rising vertically or rather at right angle to the tube of calyx, the keel & wings straight with calyx. Lower calyx lobe long, supporting keel of corolla; four upper lobes shorter, subequal. Stamens 9 + 1. Keel (and all other corolla parts) glabrous; keel adnate to wings, or perhaps better wings adnate to keel at base of limb (summit of claws), the union really seeming to

be more than connivence.

No. 6808. Ceanothus cuneatus (Hook.) Nutt. = C. rigidus Nutt.

Horns compressed sideways & wi-

No. 6809. Arctostaphylos virgata Eastw.

No. 6809a Arctostaphylos glandulosa Eastw. A well-grown bush with very large berries. I see them shining on this well-laden bush two hundred yds. away. The berries are whitish with a pink or ruddy tinge and globose or long-globose, particularly, or broad obovoid. The long ones are as much as 7 and 8 lines long, often very pointed, at least for a globose or roundish manzanita berry. They are 6 to 6½ lines thick. I find in the same sheet,

Mt. Tamalpais.

here at home, - that is taken from the same bush, typical depressed berries 3 lines high! Berries covered with fine short-glandular hairs. - Same mistake may [illegible] cf. 6847.

No. 6810. Castanopsis chrysophylla var. minor Benth.
Fine fruits from crown-sprouts which arose after the 1913 fire.

Cont. 6805. Foliage white-glaucous on margins leaves, that is between furrows as it were of ridges, in the the branchlets. I discover no glands or back of leaves.

- The trails on Tamalpais are abundantly marked with signs - except where you want one most. But the numerous signs are a great help and serve to fix

names to the trails. The anti-fire signs are also everywhere: "Break your match in two"; "Stamp out your Cigarette"; "Did You Look Back?" etc, etc. The whole region is a fine trailing ground for hikers and ought to be a public park.

- Redwood Peak Ridge, just south of summit of Snake Road. The last time I think that I was on this ridge, the hills east were clothed in tender green of early spring. But the eye loves better the dry brown wrinkled hills resting placidly in the summer sun. They speak of permanence, steadiness, quiet-steadfastness, - or as the prophets said, the eternal hills. In spring they lose, superficially, that character. There is something wistful, almost sad about the tender green, it is so fleeting!
- July 16, 1916.

Redwood Peak Ridge

Oakland Hills.

No. 6811. Mimulus luteus.
Mimulus guttatus DC. Det: A. L. G.
On swampy hill opp. cottage near Little Lake Chabot dam, i.e. Lake Temescal, but across (north) railway track. Flowering freely still. The grinning or gaping sinuses right + left of main part of throat have their position just below the clefts between lips, i.e., they are made by the lateral lobes of lower lip, or a part of the lateral lobes. Berkeley = M. guttatus DC. var. grandis Greene.

No. 6812. Lythrum hyssopifolia L. with preceding. Berkeley.

No. 6813. Rhamnus californica Esch. Var. typica C.B. Wolf
The berries at this stage are distinctly narrow or oblong

Contra Costa Co.

but pointed at each end. – Oakland Hills.

No. 6814. Ceanothus sorediatus. H. + A.
Often or at least sometimes in the form of a small tree with distinct trunk 3 or 4 ft. h., total h. = 8 or 10 ft.

– It strikes me that I have never before seen so many spp. in flower in the height of the dry season: Sambucus glauca, Godetia amoena coloring dry grassy spots, Scrophularia californica, Convolvulus luteolus, a lot of the usual introduced species, Eschscholtzia californica, Heteromeles arbutifolia, Holodiscus discolor, Aesculus californica (which shows lateness of season),

Oakland Hills

Diplacus glutinosus coloring whole hillslopes, Baccharis pilularis (a few nearly prostrate shrubs on one ridge) Arabis californica, etc

No. 6815. Holodiscus discolor. Maxim. var. franciscanus Jepson.

– I have never before seen so many persons in the hills gathering berries – today vaccinium ovatum. Three weeks ago there were people going into the cañons for Rubus vitifolius. Indeed, on reflection, I have never seen berry-gathering in the hills before at all in this region.

No. 6816. ~~Arctostaphylos Andersonii~~ Gray. Berries small, white at first, then ripening brown, very sticky

with short glandular hairs. This species shows its affinity with A. glandulosa in its small white berries + glandular pubescence.

– There are still left a few spots of wild vegetation in the cañon above Little Lake Chabot and near to the old Dargie placer: a little hill covered with live oak and a few Buckeyes on its north base, one rather large Buckeye its crown now covered with flowers; a rough rock standing up in the valley crowned with Bay Laurel; a swamp or two. There are mere islets in the sea of man pushing civilization

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No. 6817. Diplacus glutinosus Nutt. Berkeley, Claremont Cañon. See notes with spm.

Mimulus aurantiacus Curt: Det: A.L.G.

Oakland Hills

— Baccharis pilularis DC.
No. 6818 2 First seedling I ever noticed of this species.

— Ceanothus sorediatus H. & A.

	Circ. at ground.	Circ at 1 ft.	Ht. ft.
No. 1.	17½ in.	15 in at 1 ft.	13
No 2.	9 in.	Trunk 43 in. tall.	14

This "tree" had a branch which measured 10 ft. in length.

No. 3. 12½ in. at 1 ft. Trunk 3 ft. h. Total ht. = 11 ft.

No. 4. 13 in at 1 ft. Trunk 6 ft. total 12½ ft. h.

All the above trunk measurements are of circumference.

[Miss Doris Patchett & Miss Rose Wright, Bot. 104, report individuals on Redwood Peak 25 ft. h!]
Dec. 8. 1916.

No. 6819. Ceanothus sorediatus.

Bark of old trunks and branches dark, rough, verrucose. Color nearly black or sooty-brown typically. Young bark a sort of pale slime-green, smooth.

No. 6820. Ribes menziesii Pursh var. barstowi Jepson.

No. 6821. Eschscholtzia californica Cham.
Orange to yellow-with straw-color tips. — Railway embankment

No. 6822. ~~clarkia~~ ~~Godetia~~ amoena Lilja.

No. 6823. Corylus cornuta var. californica ~~rostrata~~
The first nuts found. Squirrels exterminated.

No. 6824. Arctostaphylos glandulosa

— Arbutus menziesii. — A cluster on line irrigation ditch from Hardin down to Big Oak Flat, says Easton, U.C. '86 who says he knows of none other in the region. This is at a point about 3 to 4 miles above Colfax Springs, = Colfax Gate on U.S. Contour Map.
↑Kimball

Madrones also occur between Nevada City and Grass Valley, and are conspicuous from the train windows.

— Itch Brush = Baccharis pilularis, says Anson Blake in explanation of Ned Blake's name.

— Harvesting Barley crops on an island in the lower San Joaquin near Bouldin Isl., Anson Blake says: "We now save screenings seed of Mustard, Smartweed and Tumble-weed." The

latter, from his description, I consider to be the very gross form found in lowlands which I have so far considered a form of Amarantus retroflexus but it may not be. These screenings are sold at about 75 cents a sack, for birdseed. The seed of Amaranthus is also harvested by hand by the Chinese who use it in their soups.

— Calycanthus occidentalis Irish still in full flower on Moores Creek, Howell Mt., Aug. 6, 1916.

— Greene, E. L. Sketch of, with portrait, by Rose, Bot. Gaz. Jan. 1916. Sympathetic but balanced and rather penetrating sketch.
↑J.N.

Howell Mt., Morris Creek c 1600 to 2000 ft.

– Basket-grass Lily, a name for Xerophyllum tenax.

– The Poison Oak now turned fiery red – perhaps as brilliant & crimson as we have in the woods.

– No. 6825. Quercus Kelloggii. From crown sprouts. Remarkable case of dissimulation due to mutilation.

No. 6826. Arctostaphylos viscida Parry. Mt A. mariposa. Berries very sticky, the gum susceptible of being drawn out into white threads.

No. 6827. Arctostaphylos Stanfordiana. Restricted to the summits of the mountains. Very erect. Leaves relatively narrow. Berries [cont. next p.] small and very irregular in shape, as if without definite form, or typical only in deformation.

Aug. 6, 1916.

Arctostaphylos.

Key to Species of Howell Mt.

Species of openings in the foothill woods.

Abundantly fruiting!

1. A. viscida
(branchlets of season pink)

Sparingly fruiting!

2. A. mariposa
(branchlets green)

Species of higher chaparral slopes

Leaves unlike on two sides

3. A. canescens

Leaves just alike on two sides

4. A. Stanfordiana

Howell Mts., Moore's Creek 1600 to 2000 ft.

— Arctostaphylos manzanita. The people here say "it takes the country". Abandoned vineyards or land which has been cleared is overrun with it. I have seen some of these new stands which cover the ground closely. "Nothing else will grow beneath these mature stands, even herbs" says Mrs. Blake, and also Alexander of St. Helena. My own observations run along the same line but not quite so generalized. They say it crowds out everything else; doubtless it comes very near it—, but not forest trees which have had an equal start and have gotten their heads above the mature level of the manzanita.

No. 6828. Linum spergulinum Gray. Petals white, obovatish, acutish or obtusish, with very short claws. Stamens 5. Styles 3, distinct. — By a spring on dry hillside

No. 6829. Lessingia. Florets 5 or 6, 1 or 2 of them with regular or nearly regular corollas, white and thus differing in color from the pink-purple subradiate ones. — Dry open hills

No. 6830. Quercus breweri. This is the juvenile stage of Quercus garryana! One gets it also by mutilation. It is common here in the case of young individuals 3 or 4 ft. h. In the high mts. of Trinity, type loc. of Quercus breweri, the juvenile stage is preserved by dwarfing.

Howell Mts. c. 1800 to 2000 ft. Moore's Creek

No. 6831. Calycadenia
Heads racemose. Rays 1 or 2, mostly 2, 3-lobed, the lobes subequal. Involucre with yellow glands! Disk flrs. 4 or 5, white, fading dull or greenish — Dry open hills.

No. 6832. Calycadenia multiglandulosa DC. ssp. cephalotes Gray
Heads sessile. Rays 1 or 2, 3-lobed, the central lobe very much smaller than lateral. Involucre with brown glands. Disk flrs. 5 or 6, white, fading pink! — Dry open hills.

No. 6833. Quercus garryana!
Fine trees, 40 to 80 ft. h! Here found furthest from the

ocean, at least in the Bay region. Here it grows, at the lower alt. limits of its occurrence, in company (check by juvl) with Quercus dumosa! The Redwood and Tan Oak near Quercus garryana company also.

No. 6834. Amorpha californica Nutt.
Shade of woods.

No. 6835. Amorpha californica Nutt.
Foliage from crown. sprouts.

No. 6836. Centaurium Erythraea trichanthum Rob.
Moist swales.

No. 6837. Aquilegia tracyi. Maxon = A. eximia
Bank of streamlet.

No. 6838. Senecio
Leaves fleshy, glaucous. Stems from

Howell Mt. Moore's Creek. C. 1600 to 2000 ft.

heavy creeping or decumbent rootstocks.

No. 6839. Rhamnus tomentella Benth. Leaves dull silvery beneath; dull green above. Aug. 6.

No. 6840. Arctostaphylos (viscida! not mariposa. Shrubs side by side on the red rock ridge just between Moores Creek and Chiles Valley have very different leaf aspect or color but are plainly this species — Red ridge just west of Chiles Valley

No. 6841. Scirpus microcarpus Presl. 3 to 5 ft. h. Rootstock vertical, horizontal stolons spreading from base of caudex. Margin of water, Moore's Creek.

Aug. 7, 1916

Field Notes on Arctostaphylos

— A. canescens. Keeps strictly to the summits ? = A. glandulosa? of the mountains and has heavy crowns at surface of the ground. I noticed a semicircle of erect stems yesterday on the ridge which came from a woody base suggesting the stump of a large tree, — a stump say which had partly or on one side been burnt away. It is hard to realize that the stems from this large woody base seldom get larger than they are now — say 1 or 2 inches in diam. At least I have seldom seen them larger

— A. manzanita. Very shallow-rooted. Dead mature individuals, killed by fire, after some years one can push over a tree 12-16 feet high with his hand,

— A. mariposa. cf. No. 6826. This

is not abundant, apparently, and is simply a Sierran species which is found below or on lower borders of Pinus ponderosa belt and is here on this mountain in a similar situation to what it is in the Sierra Nevada. It is a much smaller species than A. manzanita [No. 6826 = A. viscida!] A. stenfordiana. This is a smaller species than A. manzanita but still quite tall. As I remember it was often 6-8 ft. h. on the ridge above the Sanitarium. On the other hand A. canescens is low, 2-3 ft. high, perhaps 4 ft. maximum in the average. The absolute maximum I could not be sure of.

No. 6842. Helianthus
Sandy wash

No. 6843. Helianthus
Moist swale.

No. 6844. Ailanthus glandulosus. Fine trees grow along Pleasant Valley Creek and are now loaded with the winged fruits. This species is spreading spontaneously by seed and is considered a "pest" by the orchardists. The seedlings come up in the orchards, and in the wild oak lands on the hillslopes seedlings establish themselves as well as along the streams. This species is unqualifiedly a member of our spontaneous flora. — Pleasant Valley, Solano Co., 9 Aug. 1916.

Pleasant Valley. Solano Co.

No. 6845 Elaeagnus angustifolia (Russian Olive) Oleaster Buffalo Berry. Two trees stand in front of the house of Harry Hathaway in Pleasant Valley, 50 ft. h., and probably 40 years old. 9 Aug. 1916.
See p. 30.

– Monkey Ears, a name used by Mrs. Harry Hathaway for Calochortus amabilis. I suspect this name is invented as a broad humor anti-climax to Fairy Lantern, Golden Slipper and Golden Lily Bell.

– Drove in my Buick 6-45 down Howell Mt. into the pretty Pope Valley, thence along Pope Creek, the fork of Putah Creek, which cuts thru the hills east to Berryessa Valley. Pope cañon = Road narrow and dangerous. Finally ran out into the wonderfully interesting Berryessa

valley adorned with its great Groves of Valley Oak. South thru Monticello to Putah Cañon. The Devil's Gate has its door jamb adorned up and down the cleft with Aesculus californica, Umbellularia californica and Cercis occidentalis, the first two in particular forming, as it were, a vertical band up and down the sides of the gate.

Thence to Winters and Pleasant Valley. One passes in Putah Cañon, before reaching Devils Gate, the mouth of Wragg Cañon, – the most striking and picturesque view in the cañon.

At 7 ½ p.m. reached Harry Hathaway's ranch in Pleasant Valley, when I received a most cordial welcome.

Pleasant Valley

— The Buffalo Berry bees, mentioned on p. 28, are probably not more than 35 years old. The berries are sought by the robins and quail. The robins come in for the Christmas Berry berries and clean out the crop before Christmas.

— A hillside orchard at Hathaway Ranch is thick with sprouting seedlings of Ailanthus glandulosus — some as thickly as stalks in a maize field! It is a real pest and at this stage or size has a wavy look like brake coming up in a clearing! I have never elsewhere seen it so aggressive in cultivated land.

— There is a fine large Blue Oak on the hillside a little southwest of the Hathaway farm buildings, standing in a grove of oaks. It is so large that it suggests a valley oak. In this grove the elder Pleasant camped when he came to the valley as the first settler.

— Drove on down to Vacaville on August 17 and stopped with my boyhood chum Ralph Platt. The season has been a very cool one and the valley is not nearly so dry as usual, although no rain since March. Surprisingly enough it rained all night last night — making a fall of about 1/4 inch. — Aug. 14, 1916.

Vacaville, Aug. 13. 1916.

No. 6846. Eschscholtzia californica. These specimens were collected by railway track south of Davis Ranch from marked plants. See No. 6791 supra. The summer-flowering corollas vary greatly in size. They are lemon or straw-yellow, usually with a orange eye of small size.

Oakland Hills, 20 Aug. '16

— Berglus rostrata var. californica 16 ft. high (possibly 18 ft.) and 4 inches (!) in diam. at 18 inches above the ground. — Kohler Cañon.

— No. 6847. Arctostaphylos glandulosa. Moraga Ridge. ↗

— Chamise simulating cloud-shadows. The low peaks northerly from Mt. Diablo lie with shadows

(Contra Costa Co.) Moraga Ridge, 20 Aug.

on them — but shadows under the cloudless blue California sky. The high peaks have "shadows" too, but do not deceive as the dark ceanothus is plainly chaparral; the lower "shadows" are plant-formations too but are terribly tantalizing because the close simulation of shadows and the eye goes back to them again and again, as if trying to make out that they really are shadows. It is, I think, the effect of a very even stand of chamise (Adenostoma fasciculatum) and heightened by the way in which the yellow hills stand about them.

Note the depressed berries often umbilicate a little small at apex. This cannot be the same species as 6809. This number, 6847, is certainly A. glandulosa.

Oakland Hills. Sept. 3, '16

- Baccharis douglasii. Semi-gregarious on dry open hilltops where nothing else grows. It is therefore exclusive by virtue of its power to get sufficient water by appropriate spacing of individuals the effect is often a little like young trees in an orchard.

- Americans and especially, perhaps, Californians, do not know botanists. One goes into the field but is not recognized as a plant-student. His equipment provokes inquiry from the Sunday excursionist:—
"Well, are we going to have a little music today?"
"Bin trapping birds"?
"Peddlin' papers?"

- No. 6848. = A. rubra ssp. arguta
Actaea spicata var. arguta Torr.
A heavy spike of ~~its~~ brilliant crimson berries shine like a spot of fire in the tangled undergrowth in Redwood Cañon just below Redwood Peak, the true Redwood Cañon.

- No. 6849. Ceanothus sorediatus Specimen of the wood, light-green smooth bark. Shepherd Cañon, Oakland Hills.

Oakland Hills, Sept. 9, 16.

- Arctostaphylos glandulosa Roots freely from the decumbent branches! Forms very heavy platforms of wood.

- Vaccinium ovatum, forms rather heavy woody bases

- Quercus wislizeni var. frutescens, and agrifolia var. frutescens. Both grow here in the

Oakland Hills, Alameda Co. Sept. 9, 1916.

hills and are often hard to distinguish, but in general the former in its dwarf state tends to accentuate the foliage of the arborescent form and the latter to narrow the round leaves of the accentuate arborescent form of Q. agrifolia

-No. 6850. Corylus cornuta ~~rostrata~~ var. californica. A spike of catkins, a dense spike inches long, was discovered by M.E. Harvey student in Botany 104. It is a very remarkable find. I have never before seen anything like it.

No. 6851. Neillia capitata Greene. = Physocarpus " K+Z.

Oct. 15, 1916.

- Drove down from Berkeley yesterday. There is a long hedge of of Prunus ilicifolia on the right-hand side of the road going into Mission San Jose. It makes a rather fine hedge. More of it left-hand side.

The Valley Oaks in the Santa Clara Valley have developed a second growth this very cool summer. This growth is from the buds formed at the ends of the first growth and which were destined to be the winter buds. The new growth is light-colored and gives the crowns a very peculiar, almost mildewy appearance. No other oak here has been affected, they say, certainly not the live oaks. I take specimens

as follows:

No. 6852. Quercus lobata Nee showing old and new growth of one summer.

Las Trampas Ridge.

- Ceanothus sorediatus H.&A. 13 ft. high!
- Salvia
- Black Sage. Two to 5 ft. high.
- Ceanothus cuneatus
- Adenostoma fasciculatum H.&A.
- The maple (Acer macroph.) is very glorious in its autumn yellows on the steep cañon sides amongst the oaks and madrono. I think I have never seen so fine a scene of its kind as a cañon with steep walls just east of Las Trampas

hog back — the fine colours of Acer macrophyllum, the greens of Quercus agrifolia, the lavender band running up the shoulder of the hill (winter condition of Holodiscus discolor? or Poison Oak? Neillia? or Blackberry tangle?;) and the little opens with the tender green grass just coming. It is a lovely wild bit of country with rough hills about it. Best of all the billowy crowns of Live Oak and Maple filling the cañon depths.

- Rhus diversiloba
- Heteromeles arbutifolia.
- Zauschnoria californica in full bloom.
- Arctostaphylos glandulosa with heavy platforms
- Quercus chrysolepis!
- Eriodictyon glutinosum Bth.

Las Trampas Ridge.

Contra Costa Co.

Oct. 22, '16

- Holodiscus discolor
- Dipsacus glutinosus Natt.
- Umbellularia californica
- Garrya elliptica !!
- Quercus agrifolia. No Q. wislizenii noticed.

This trip taken with Professor Walter Mulford.

No. 6852a. Artemisia californica Less.
No. 6853 Protostaphylos glauca Lindl.
no 6853a. Acer macrophyllum. See p. 38.

Moraga Ridge, Oct. 28

- Carpus pubescens, 14 ft. h.!
- Amelanchier alnifolia, thicket small at n. end of ridge proper
- Dendromecon rigida, the dead stems of the tufts numerous.
- Quercus wislizenii var. frutescens, leaves in a rosette, the teeth more numerous than in Q. agrifolia.

Moraga Ridge, Oct. 28, '16

- Quercus morehus Kell.
- " agrifolia and chrysolepis

The above are the four oaks of Moraga Ridge.

- Arctostaphylos glandulosa 7 ft. h.!

Bottom of San Leandro Creek Canon

Redwood Circle

25 1/2 x 19 1/4 feet

Trunks - Diams. at 4 1/2 ft. -

3 ft. 7 in	2 ft. - 3 in
2 " 2 1/2 "	2 ft. - 4 in
3 " 1 1/2 "	2 ft. - 5 in
2 " 9 "	1 ft. - 1/2 "
0 " 10 "	2 ft. - 3 in
0 " 10 1/2 "	0 - 9 in
2 " 9 "	0 - 7 in
2 " 3 "	1 ft. 4 in
1 " 0 "	
0 " 9 "	
0 " 4 2/3 "	

Bot. 104 trips.

– Rhamnus crocea, 8 ft. h. ↑ to 10
Many-stemmed clump, after the fashion of Ceanothus cuneatus, etc. stems erect, from a root-crown

– Adenostoma fasciculatum
Trunk 8½ in. circ. at ½ ft.

– Quercus agrifolia!
Mitchell Cañon, right fork. Saw only this species of Live Oak.

– Adenostoma fasciculatum.
Pure formation on Mt. Zion and Black Pt. very even. Only an occasional shrub of Heteromeles arbutifolia in gulches or Pinus sabiniana, a lone tree in a very few places, or following a dike straight up a hillside

– Followed the right-hand fork of Mitchell Cañon which leads out to the west side of the mountain

along an old roadway between the main mass of Mt. Diablo and Black Point. Vehicles once went thru here but would not find a good road now, tho' the passage could be made.

No. 6854. Arctostaphylos glauca Lindl. 4 to 5 ft. h. Only a few shrubs seen but probably more abundant farther up the mt. They are very white and can be seen long distances. "Berries" can readily be found in the dry litter beneath the bushes. Just beginning to come into flower, a few corollas showing on one individual. The stamens are subglobose-thickened at base and hairy on the undilated portion above.

— Sat. evening meeting of Cal. Bot. Soc. Nov. 11. in Oak. Heath spoke of the Water Hyacinth occuring in a pond east of Fresno in the foothills; Miss Bruce Walker, of Marin, of a Redwood, which had awl-shaped leaves all over the tree and no flat sprays, growing at Lagunitas.

— Went to the funeral of Mrs. Blanche Trask, the local botanist of Catalina Island, in San Francisco. She died at Colfax, Nov. 11, whither she had gone on account of her pulmonary trouble. The service in Gray's Undertaking Chapel, conducted by the Rev. Bradford Leavitt, was very beautifully done. It was simple and in most excellent taste everyway. Nevertheless I found it difficult to fix my mind on the words of the service. Mrs.

Trask was as, Miss Eastwood expressed it, "a wild woman". She had given up all that wealth could afford, and the pleasures of a social career to live her life on Catalina! If she had died on Catalina it would have seemed fitting. But she was buried in a great city with only two or three persons present who had known her and no relatives! It seemed tragic, and as the words of the service went on my mind left the confines of the undertaking chapel and I saw Mrs Trask, once again, standing on a high bridge beyond Avalon in the moonlit shadows far in the night in silent worship of the sea and air, completely controlled by love of strange beauty and mysticism.

Mrs. Trask botanized ardently on her island. She took long

journeys on foot, with a shepherd's staff and a bit of food. She discovered several new species and collected many rarities. Cercocarpus Traskiae is a good species and will keep her memory alive in relation to the Botany of Santa Catalina Island. — Nov. 14, 1916.

The casket was covered with several clusters of very beautiful garden flowers, and at one end Miss Eastwood had laid a flowering spray of Cercocarpus Traskae and also a branchlet of Ceanothus arboreus, both Santa Catalina Island.

— Stanford has acquired the Parish Herbarium of 50,000 sheets for $3000 cy. Purchase just made. — Nov. '16

— The Lemmon Herbarium is for sale. Mrs. Lemmon is now in the Stockton Insane Asylum. Robinson (Harvard) made an offer on it, Hall having appraised it for him. Hall says 40 percent of the specimens are without data (labels).
— Nov. 13, 1916.

— Acer macrophyllum. There is no maple in San Leandro Creek canon just west of Moraga. At least I have noted none. Why is this? Too close to the Redwood? Acer negundo var. californicum is found there, but sparingly. Acer macrophyllum grows near head of Strawberry Creek, south fork, in the high hillslope.
A. negundo var. californicum is in San Leandro Creek Canon and one sees it again in the pass towards Moraga Valley. But See page 50.

Berkeley

– Prunus marginata. Seed, 3 lots given to Mr Hein, of Mrs. A.H. Grant's seed from Tuolumne Co., nos. 384, 363, 362. –

Three lots seeds given to Bot. Garden, nos. 360, 379, 385.

– Mrs. Blanche Trask had wonderful reserve strength and could undertake long botanizing journey on Catalina with the minimum of food. One trip she had with her, her daughter Caroline and Caroline's school chum. One noon they stopped and in answer to the query as to whether they would have beans or prunes the hungry children cried: "Both". "You can't have both" was the stoical reply, Beans or Prunes? When Mrs. Trask was botanizing on San Nicolaus

Island – she made the trip with some of the sheepmen who go to the island – a fearful wind storm arose and one of the sand-dunes began to move and in moving uncovered an old Indian burial ground, and offered Mrs. Trask a fine collection of ethnological material which she eagerly accepted. In this place she found the skeleton of an Indian who had been killed by a stone javelin; the manner of his death is incontestable for the stone point of the javelin still stuck between the ribs and had not fallen away as the flesh of the body decayed. This lot of San Nicolaus bones she donated to the University of California.

— Brodiaea capitata. Miss Alma Ames says the children at Tujunga called the bulbs school (which they ate) coquimito which is, I conceive, diminutive of the spanish for cocoanut.

— Acer macrophyllum. One or 2 trees on east slope Palo Colorado Ridge opposite Pinehurst stat. acc. Lawton, Bot. 104. But none yet reported from Redwood Cañon just below Redwood Peak. — Dec. 18, 1916.

— Redwood Peak trip, Dec. 17, 1916.

Erodium botrys, covering the ground closely in an "open" near the peak summit on west side.

Rubus vitifolius, looked carefully over half-a-dozen thickets and saw only 3-foliolate leaves on the long canes. Finally noted a few simple leaves approximate to remnants of inflorescences.

In Shepherd's Cañon I noticed

Baccharis pilularis dying out very extensively, on the steepest part of the brushy slope on the south side the cañon near its mouth; replaced by Rhamnus californica, Rhus diversiloba, Symphoricarpus racemosus, Rubus parviflorus, and first of all by Rubus vitifolius. On this brushy hillslope everywhere millions of young shoots a few inches high of the new growth of Scrophularia californica; it is uniformly "underfoot" everywhere, forming a pure under layer to the brush which now has a thinner crown, is more pervious to light than it ever is at any other month. This species grows only in rich soil and there is always a mulch of loam under the brush wherever this exists. Again on the bare ridge above, I noticed a sharply

Redwood Peak, Dec. 17, 1916.

defined patch of Scrophularia, but it was coming up thru the dead carcass of an overthrown Baccharis pilularis. B. pilularis is more abundant in this individuals towards the top of the slope and has fewer associates, but with plenty of Rubus vitifolius just here.

- The patch of Adenostoma fasciculatum on the west crest of Palo Colorado ridge is in good view from Redwood Peak. It is sharply defined and does not appear to have moved much if any in a long time.

Saratoga, Dec. 26.

- Redwood. Comes down to valley level along Saratoga Creek.
- Baccharis pilularis, often 9 ft. h.,
- Rhus diversiloba, 8 ft. h., a common height does not die back normally!
- Islay. This word occurs Macaulay, Hist. Eng. vol. 2. p. 460.

Oakland Hills, Nov. 5, 1916.

- Baccharis pilularis. The slopes of the other ridge just north of Redwood Peak are brave with the flowers of Baccharis pilularis. The shrubs look very attractive after the rain, the intermixture of white females and very yellowish-white males. These shrubs are seldom noticed in flower, I take it, but are remarked in the showy or more noticeable fruiting stage. There is a colony just north of Redwood Peak that is very beautiful, unexpectedly beautiful, since the first time I ever remarked its beauty. At a distance, in Redwood Canon, they look like low mounds of daisies or dense bunches of popcorn flowers. This species should be planted but on slopes to be observed at a distance. Coyote Brush, I call it, because most of the year ragged and ungainly like the

coyote amongst mammals.
- Symphoricarpos racemosus, 6 ft. h. gregarious.
- Rhamnus californicus, usually in round clumps.

- The Forest Service Rangers Convention has been meeting here in Berkeley - Jan. 3-12 '17. I took advantage of the convention to secure information about Carpenteria californica Torr. F. Price, ranger at Auberry (P.O.) says it occurs on Italian Bar Trail, s. side of San Joaquin River, 2500 to 3000 feet. Most of it T9S, R 24 E, Mt. D. Merid. Occurs near Power-House No. 1., n. side San Joaquin — 3 dw. Mainwaring (Forest Ranger). "Lots of it 3 to 4 miles of Auberry" - Price. Mainwaring says that the sheep scarcely touch it because it is so terribly bitter. This fact would

account for its flourishing locally in spite of the sheep, as the sheep would otherwise have reduced it greatly, probably, in sheep days. Price says that Booth, ranger in district n. of him can give further information. It interests me that Mainwaring confirmed my observation as to the rapid response of Ceanothus seeds in germinating after fire.
- Calaytonia perfoliata. Mulhall has been working on it and says he finds 40 distinct strains, each in a distinct area, here about Berkeley. He finds that the seeds rest one whole year, which on account of taking so much time, defeats his plans for working on it genetically. He has tried in vain to break the rest period. He is Asst. in Botany & grad. student. - Fo. 8. 1.

— Mrs. A.L. Grant was here from Stanford today. She says Stanford paid Parish $3000 for his herbarium; that President Wilbur is well disposed towards the dept of Botany and wants to advance its prosperity in every way; that Prof. Dudley's herbarium is now being rapidly mounted (Dudley would not allow it to be mounted in his life-time). — Feb. 6.

— "Buckeyes in full bloom in lower Napa Valley (Suscol House). Seemed healthy but are 60 days too previous" — R. H. Platt, Feb. 10.

— Ceanothus integerrimus Benth. Ralph Hopping says that while engaged on his tourist work in Giant Forest he had occasion to bring up rough beef cattle from the foothills; that these cattle were very poor beef but that in

two weeks they were finished off on Ceanothus integerrimus browse, so as to make a very superior beef product and which excited the highly favorable comment of U.S. army officers stationed in the park. —

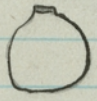
— Dr. Jos. Grinnell is arranging a field trip to Death Valley this spring. I expect to join his party later. He went to see Corkhill, the manager of the various mines who took him to Ryan, the head man of all the borax properties in the Death Valley region and President of the Tonopah and Tidewater Railway. Not so many years ago these men were decent prospectors in that region, following burros. And they said, as they trawled across that waste: Some

day we are coming in here in our private car. Now there is a railway and they do go in in a private car. Grinnell said it sounded like one of the old romances of change in California to hear them talk. They spoke most enthusiastically of the Death Valley basin – the finest climate in the world up to the middle of June; you can drink the water almost anywhere; when you go out take double the amount of water you need and then you will not suffer; persons get caught by thinking they will need only a little water and they stay out longer than expected or a drying wind comes up and this is fatal, since it is worse by far on the body than the same temp. without wind. They have a

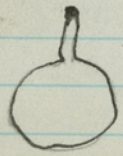
great interest in the vegetation and referred to the last "bug-hunters" in the valley, the Death Valley expedetion of 1891. All such people are "bug hunters", whether after plants, mammals, insects or what not.

– Smilacina amplexicaulis ? Nutt. vs. S. racemosa.

Under my direction L. S. Smith has worked out the differences between these two species. The latter has a very short style and the whole pistil is somewhat so:



whilst the former has a pistil so:



S. racemosa has petioled leaves; S. amplexicaulis sessile and

broadly clasping ones. This species is found to occur along the Pacific Coast and east to New Mexico and Colorado. V. racemiosa probably comes west to Idaho. The differences are very constant.

— Miss Rosabelle Sinnes (Bot. 104) says the children at Oakdale eat the nuts of Quercus Douglasii; the finest (the most glaucous) are considered the best.

— Mulla carnata Greene, type coll. by Dr. C. C. Parry, Lancaster, Mohave Desert, Mar. 1886; per label in Parry Herb. Like M. maritima in habit but short. Flowers the same size as those of M. maritima. Inner per. segs. perhaps a little broader than outer, all with distinct and marked but narrow white scarious border.

The filaments are remarkable, quite broad and the same width top and bottom. The summit is retuse with very distinct shoulders, the anther versatile on a short slender projection in the notch. There is no doubt about its being a well-marked species.

Perianth 3 to 3½ lines long, same as that of maritima. Flowers 3 to 5 or 7 in an umbel. Plants 1½ to 3 in. h. (above ground).

Notes taken from plant in Parry Herb. — coltghe.

— Baker, C. F. Concerning him E. S. Heath says: "He is primarily an entomologist and had his training under Cook at Lansing, Mich. Cook taught a great variety of subjects there and later at Pomona. Bassey was taught by Cook at Lansing. Both Cook and Baker left their herbaria and libraries to Pomona College." Cook had a long career of great vigor. He was 70 or past when he became State Horticultural Commissioner of Calif. Copeland collected sets for Baker's distribution of Cal. plants. Baker is now under Copeland in the college at Manila. — Dec. 17

– Whipplea modesta Torr.
Stamens 12, 12, 10, 9, 10, 10, 8, 8, 10, 10, 10, 10, 9, 9, 12, 12, 12, 8, 10, 10.
Pistils 5 or 4-carpeled, i.e. Styles 5 or 4.

– Arctostaphylos Nummularia, on zig-zag trail from hill Valley to Pipe-line Bridge near summit. Ovary pink-hairy, resting on an 8 or 10-angular cushion; dark purple cushion. Flowers often 4-merous. [This Arctostaphylos of Tamalpais now equals A. sensitiva Jepson.]
– Arctostaphylos glandulosa with preceding. Ovary very white-hairy; not densely, but pink-hairy.
– Rhododendron occidentalis Gray. Stump-shoots freely.

– No. 6855. Viola sarmentosa Dougl. =V. sempervirens Greene
Shade of redwoods in cañon, Mill Valley.

– No. 6856. Saxifraga laciniata Hook.

– No. 6857. Luzula
Openly wooded hillslope.

– No. 6858. Zygadenus Fremontii Torr.
Rich soil of woods.

– No. 6859. Marah fabaceus (Naud.) Greene = Echinocystis Marah.
Calyx-teeth obvious in ♂ flo. Calyx-teeth slender, a sort of margin connecting the teeth, so that the calyx is really defined from the corolla. Anthers on staminate plant minutely pubescent. In one ♀ fl. I find vestiges of (?) stamens,

being short scales beneath the stigma. I see nothing that looks like or suggests anthers, let alone pollen. In another ♀ fl. I do not see scales or vestiges even.

No. 6859a. Nemophila menziesii H. & A.

— Oxalis Oregana, blooming very profusely in shade of the Redwoods in bottom of cañons. Corollas lavender! or pink, as noticed today.

— Fritillaria biflora Lindl. The Douglas plant from Calif. I have borrowed from Gray Herb. Two spms, one 5½, the other 7 in. h., both broken off near the ground. Largest or main leaves 5½ in. long, 7 lines broad. Match well with one plant of the Metzler collection, San Luis Obispo. Two

flowers on each stalk!, 9 or 10 lines long. Stems with 2 or 3 leaves at base, and 1 or 2 smaller leaves above, about at middle. Not the San Mateo narrow-leaf form.

— Erythroniums, fresh fls. sent by Purdy, Apr. 11, 1917.

E. grandiflorum — egg-yellow per. sacs. at base 4, equal, not very distinct from each other, but plainly 4 in number. Leaves a fresh bright-green without spots and only a little undulate. Anthers straw yellow, those of the var. multiflorum garnet. Sacs only on inner per. segs.

— E. californicum — cream-color or somewhat yellowish. Sacs at base of inner per. segments 2, large but low, the lateral sacs reduced to a transverse ridge. The attach-

ment of the segments is reduced to a very narrow base beneath the sac shoulder, in this and the preceding sp. Purdy also sends a white-flowered form. Leaves strongly mottled.

- E. hartwegii. Sacs 2, prominent, with a very slight lateral ridge but with marked auricles. Per. cream-color with yellowish center. Leaves mottled, the mottles smaller than in E. californicum.

- E. giganteum. Sacs 4 but the lateral small. Per. white with burnt-umber or reddish brown markings towards the center. Leaves mottled.

- E. Hendersonii. Per. purple with lighter center but with purple

spots or base. Sacs 4, subequal but the central pair larger, very much inflated or bulbous, that is globose-bulbous. In E. californicum the sacs are wrinkled and somewhat compressed. In E. grandiflorum they are in similar case, that is to say they are irregular in shape, ridged or flattened or so on, in any event not regularly inflated and full as in E. Hendersonii which are like very full woman's breasts. In E. hartwegii they are rather distinctly compressed fore and back, not laterally. Leaves mottled in E. Hendersonii

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Oakland Hills – Apr. 14, 1917 Contra Costa Co.

No. 6860. Trifolium albopurpureum T. & G. Disturbed soil by rr. track.

No. 6861. Viola pedunculata T. & G.

Oakland Hills Contra Costa Co.

Flowering abundantly on the open summits near Redwood Peak.

No. 6862. Viola glabella Nutt.
Shade of the Redwoods, Redwood Peak.

No. 6863. Agoseris heterophylla Greene
Open summits

No. 6864. Baeria
Open summits.

No. 6865. Trifolium gracilentum T. & G.

No. 6866. Trifolium barbigerum Torr.
Cor. inflated at base, 1.5 mm to mouth of calyx-tube.
Forming colonies, almost mat-like.

No. 6867. Trifolium amplectens T. & G.
Sterile hillsides.

This trip was with the Bot. 104 class.

– Charles Louis Pollard just called for a few minutes. He is out of Botany now, has been traveling in Eur. with an Eastern party (evidently he is tutor to a boy of wealth). He remarked, incidentally & an inquiry if we had many of Greene's Types, that Greene never mark a Type as such.

– Howell, J. J., Geol. Distribution of N. Am. Forests. Pop. Sci. Mo. 23: 517 (1883). Howell shows that N. Am. forests can be divided into 3 or 4 distinct floras, corresponding to the different geological formations they inhabit.

Berkeley to Ludlow

— Yucca mohavensis in Tehachapi Pass proper.

In the valleys about Tehachapi town the fields were yellow with a tufted butter-cup 4 to 6 inches high. This must be R. Ludovicianus Greene. — Apr. 28.

Left Ludlow at 4:50 on the morning of the 29th.

— "Chilopsis saligna Don," near Crucero, common in the broad wash of the Mohave River, many-stemmed, 12 to 14 feet high, round-headed clumps.

— Chaenactis (no. 6868).

Scales 4 (2 long and 2 short, 3 long and one short, or 4 long observed in one involucre, — always unequal). Corolla pale pink. Corolla lobes toward apex

on back with short spreading hairs. — Rasor.

Soda Lake, sink of the Mohave River has no water or not any obvious from train; but Silver Lake is a real lake of considerable extent. The railway line formerly went straight across it instead of around it as at present. Possibly there was little or no water when the line was built. There is sufficient water now to render the track unstable under the beat of waves in a high wind, unless heavily ballasted with rock.

We can now look through a pass between the desert ranges to a heavy mountain chain to our left northwesterly. It is apparently snow-covered — ? The Panamints. Then the train after a bit turns to the right and after a bit

just below Sperry, I see a tiny stream of living water in the bed of the wash. It is the Amargossa River, a tiny stream, but running briskly, — and the equivalent of a river for this land! We follow up the right hand side of it and wind through a canon with rocky walls. And then at Tecopa we run out into an open valley. There seem to be a great many springs in the green flats at Tecopa, probably most of the sources of the Amargossa River at this time of the year.

Prosopis juliflora and pubescens both occur here.

At Zabriskie I find Anemopsis californica in flower and large bushes, 10 ft. high and very broad of Atriplex lentiformis Torr. the Quail Brush. Far off to the

East of Death Valley Junction is a huge snowy range, with snow so heavy as to appear perennial. It is doubtless the Charleston Mts. and I find at Ryan an engineer who says Charleston Mts. and that they carry snow the year around.

From Death Valley Junction west is by narrow-gauge railway. I was met at Ryan by Arendt, 1914, who was commissioned to meet me by Wm. Faulkner, the Superintendent of the Borax mines. I was taken to dinner and am to be taken down to Death Valley this afternoon to join Dr. Grinnell's party which has been in the region over a month. { Dr. Jos. Grinnell. Mrs. Jos. Dixon. Mr. L. M. McQuesten.

No. 6868. ~~Chaenactis~~ *Palafoxia linearis* Rasor. See p. 70. Its stiffish fleshy straight-leaves are peculiar

Ludlow to Ryan. INYO CO.

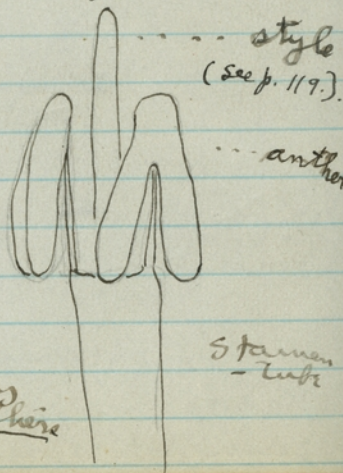
No. 6869. Cryptantha costata Bg. Razor 29 Apr. east central Mohave Des. San Bernardino Co.

No. 6870. Psathyrotes ramosissima Gray. Furnace Creek Ranch

See p. 124. Fragment - Discarded LR# 1965

No. 6871. Baccharis sergilioides Funeral Range. Mostly 1 to 2 feet high, sometimes 5 ft. Bushy. Eaten down by cattle apparently. Moist alkali

No. 6872. Sisyrinchium funereum. Bicknell wet or moist alkaline swales, Funeral Mts. Style slender, terete, with annular or other thickening.



2 anthers only showing, the others removed.

Inyo Co.

No. 6873. Oxytenia acerosa Nutt growing in clumps in moist alkaline swales, clumps 1 to 4 ft. broad. Stems die to ground each year. Apparently 2 ft. high, perhaps more. at Texas Spring. above Furnace Creek Ranch.

No. 6874. Grass, moist alkaline swales.

No. 6875. Peucephyllum Schottii (Gray) Gray ~~Ericameria~~ Two to 3½ feet high. See p. 107-8. See p. 81.

No. 6876. Anemopsis californica Prominent runners at this time. Alkaline swales, Funeral Mts. Yerba del Manso say Denton; used for boils, cuts, sores, — in animals and in humans.

No. 6877 Carex Common sedge in wet alkaline swales

From Ryan one has a good view of the white floor of Death Valley with a few patches of green — the groves of Mesquite (Prosopis juliflora). The scene has all the sense of mystery that attaches to the name. Red, brown, green, white, terracotta, black, in all the richer deeper shades color the mountains which bound the valley. The Black Mts to the south of Funeral Creek; Funeral Mts., their lower hills dressed in bands and patches of a mourning color, a dark dull cambric color such as was once used for mourning dress in the country; the Grapevine Mts. further north, — all this in one range. On the opposite

side of the valley and very close at hand are the Pantamint Mts; its high Telescope Peak and immediate neighbors under snow. On the east side of the valley along the foot of the Funeral Mts. at the lower altitudes is a water-bearing stratum, about opposite ~~South~~ to the Furnace Creek Ranch. One sees it crop out also in Furnace Creek Canon. It is not continuous but uninterrupted, and I do not know as yet how far north or south it extends.

The stunning thing at this season is the green, the fresh young green of the mesquite. The trees, dotting the flats, one broad and sprawling grace, one a bank, are often very beautiful. They are in full flower now. The clusters of pods may

represent ovaries of a single spike, or may represent the spikes of the cluster.

One of the startling things is to see grapevines at Texas Spring. They are just coming into full leaf. Branches 2 to 6 feet long. Trunks 1 to 4 inches diameter. Low and spreading. †(Vitis)

The Furnace Creek ranch is the property of the Pacific Coast Borax Co. Denton is the Superintendent here. A village of Panamint Indians is near the ranch house. The ranch is a beautiful oasis on the terminal fan of Furnace Creek. The ranch house and buildings are clustered in a grove of Cottonwood (planted), Washingtonia filifera, figs, etc. They

have alfalfa fields here.

— Mesquite (Prosopis juliflora) is used here at the ranch for the posts, it is said, last only a year on account of being riddled by beetles. I have noticed the fence posts very close together — far closer than necessary for barb-wire — the reason being that new posts are continually being added betwixt old ones.

No. 6878. Juncus mexicanus Willd. Det. P.V.C.
Moist alkaline swales.
Funeral Mts.

No. 6879. Euphorbia E. parishii Greene polycarpa Oth. var. parishii Jepson
Furnace Creek Ranch

No. 6880. Vitis girdiana Munson.
See preced. page; Texas Spring, Furnace Creek Ranch.

Funeral Mts. 2300 ft.
Inyo Co.

No. 6881. Juncus cooperi Engelm.
Funeral Mts. Moist alkaline swales.

No. 6881a. Haplopappus acradenius (Greene) Blake
Zabriskie, Inyo Co. det. R. Bocquelupi, Feb. 1964.
(not in Funeral Mts.)

No. 6882. Sporobolus airoides Torr.
This grass grew about springs
Det. A. S. H.

No. 6883. Pluchea sericea Gray.
Alkaline moist places.

Dunal
No. 6884. Nicotiana trigonophylla Gray. dull white. Many-stemmed, 1.25 to 1.5 in. h.

Hofmeisteria pluriseta Gray
No. 6885. ~~Peucephyllum Schottii~~ See p. 87
Stems multitudinous forming a dense intricate round bush 2 to 2½ feet high.

Petioles very long and blade small
No. 6886. Gutierrezia microcephala (DC.) Gray
Aff.
Densely branched round bush 1½ ft. high

For itinerary see p. 85 at bottom and p. 161 at top.
Apr. 30, 1917.

No. 6887. Bebbia juncea Greene.
With a multitude of stems, very much, but rather straightly branched, but densely bushy and always forming a broad bush resting on the ground 2 to 2½ ft. high, 3 to 5 ft. broad. Pappus plumose. Scales chaffy. — 1 May, 1917.

Peucephyllum Schottii Gray, no. 6885 is the main bush in the wash up which we travel for some ten miles. It is a bright & pleasing deep green shrub 5 feet high, and usually somewhat broader. It has a heavy root 4 to 6 in. diam. which apparently goes straight down. To 8 in. diam! Has one trunk only!

Funeral Mts. Inyo Co. 2300 ft.

Mimulus Bigelovii var. cuspidatus Grant: del: A.L.G.

No. 6888. Mimulus See p. 96

Cor. purple, subregular but distinctly irregular 2-lipped. Throat or lower side with 2 yellow folds, with a border of darker or velvet purple. Also + mostly Furnace Creek.

No. 6889. Cryptantha racemosa Greene.

No. 6890. Encelia virens Parry.

Bushy spreading plants, the stinging bristles hanging on to one's hands in clusters like the fine spines of cacti; — shade of cliff. See 4 pp. ahead.

Really a "shrub" with woody stems, but it doesn't look it at first. Stems decumbent. See p. 90. See p. 86.

No. 6891. Salvia funerea Jones.

Bushy 2 to 2½ ft. h.

Corolla purple — a real purple. Lower lip with the middle

lobe produced, rounded, crenulate, having a little or no keel, the lateral lobes small & much shorter, supporting as it were its sides. Upper lip cleft, its sides turned back. Stamens 2, glabrous, the anthers separated on a connective; upper anther half turned downward (or pendulous); the lower half horizontal and larger. See sketch of lower lip 2 pp. ahead (p. 85)

No. 6892. Viguiera reticulata Wats.

Lower but erect bush 2 to 3½ ft. h. Corolla-tube bulbous at the middle! Pappus of short erose scales. Achenes pubescent. Stems white-barked. Rays sterile. See p. 91.

No. 6893. Physalis crassifolia Benth.

Fls. pale buckskin yellow. Cor. minutely pubescent outside. Filaments with branched hairs! A spreading T-shaped band of hairs at summit of cor. tube between each stamen. Style dilated upwards a bit. Branches woody at base, 10 in. h., 1½ to 2 times as broad. Root heavy. Wash.

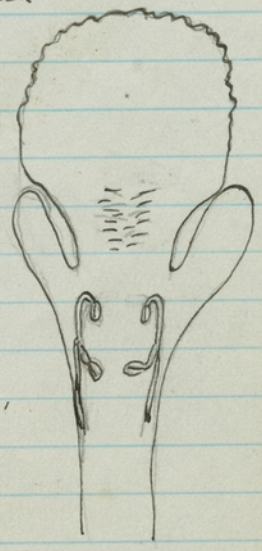
Funeral Mts., Inyo Co. 2300 ft.

No. 6894. Opuntia basilaris Engelm. & Bigel.
This fan-cactus is not rare. Each lobe 1 to 5-flowered.

No. 6895. Stephanomeria runcinata Nutt.
Dense straw-white bushes, densely and intricately branched, quite "dead" at this time, but shrubs with small linear-subulate green leaves from the lower part of the stem. The wash about our camp at the foot proper of the Funeral Mts. is white-spotted with these dry round bushes 1 to 2 ft. h. 5-ligules, dull white.
See p. 105.

No. 6896 Franseria dumosa Gray
1 to 1½ ft. h. Common in the wash for many miles with Pencephyllum Schottii, no. 6875.

Cont:
No. 6891. Salvia funerea Jones.
Corolla tube much exserted from calyx, and arising from a woolly-white ball. The wool forms a ball-like calyx, but the calyx proper is cylindric, 5-short-teeth, the teeth cuspidate like the bracts.



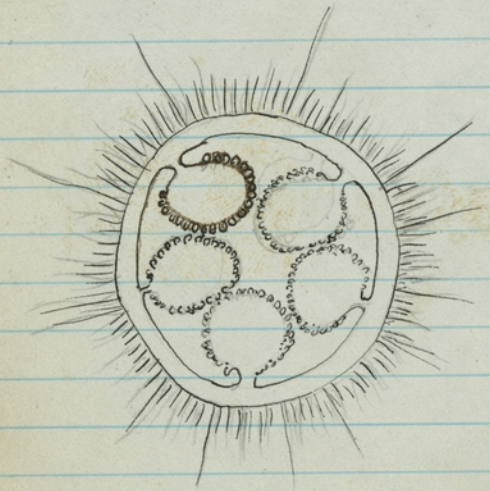
Gray shrub, not white, but whitish.

—From Ryan I joined Jas. Grinnell and his party in Death Valley. On May 1 & 2, Grinnell, Dixon and I drove in the Ford ten miles up a wash in the Funeral Mts. and spent the night. On this trip I got nos. 6894 to 6912. We came back the second day, but on reaching Furnace Creek Wash, Dixon went up to Ryan for supplies and I walked on down the wash (see p. 94) to the ranch. Grinnell went up to Ryan maybe or on a trip of his own for the rest of the day. —W.L.J. 12-9-35.

Cont. p. 161.

Funeral Mts. 2300 ft.
Furnace Co.

-Count. no. 6890.



The flowers of this, nearly full grown buds they are now, are appearing on the branches of the leafy bush which bears last year's capsules still!

= In full fl! Petals oblong-obovate, apiculate, between cream & white. Style declinate. None of the outer fils. are dilated. I judge there are about 7500 ovules in one ovary! Stigma!, small.

-Count. no. 6885. This has a curly effect. The bush is very dense & low, and after flowers the branches curl or curve inwards somewhat, giving a billowy effect. Very aromatic, or somewhat fur-weed-like.

- Heliotropium curassavicum L.
" Prosopis juliflora, in full fl!
" Prosopis pubescens, in bud.
- all near Furnace Creek Ranch.

- Larrea tridentata. Rare but widely distributed thru the region. That is, rare as compared with the Mohave Desert.

" No. 6897, Atriplex hymenelytra, Wats. Common throughout the region traversed; dry mesas. The only

striplex in the region, so
fas as I have seen.

No. 6898. Boerhaavia annulata Cov.
Leaves and stems glandular-pilose. The spreading hairs rise out of a globule of resin which rests on the epidermis. The infl. of the very poor and fragmentary specimen shows a bud of 3 flowers, each lateral fl. subtended by a bract and 2 smaller lateral bracts, the middle flower with a bract on each side. Bracts and smaller bracts long-ciliate. 3 fls. so, —

(⊖ ⊖ ⊖)

In wash. See p. 90 and p. 123.

— Barrel cactus
On sides of a great dike.

No. 6899. Dalea mollis Bth.
Wash.

No. 6900. Franseria dumosa Gray.
Wash.

No. 6901. Bebbia (Discarded, insect damaged)
1 ft. h., diffuse. Wash.

— Aster tortifolius. Rocky side of the dike near camp.

No. 6902. Encelia frutescens Gray
Achenes flat with a margin bearing a heavy fringe of hairs. Proper pappus very short. Peduncles very long and naked. Rays 17, 17, 19, sterile. See p. 92. " " 105.

Funeral Mts 2400 ft.
Inyo Co.

Com:

No. 6898. Boerhavia annulata Cov. 5 ft. tall, slender. Stems several from the woody crown of a perennial root, noticeably viscose on lower part. Swollen nodes are a feature. Calyx corolla-like, pink, funnelform. Stamens 3.

No. 6903. Aster tortifolius (Gray) Apparently common. Dry rocky hills + in washes.

No. 6904. Brickellia 2 1/2 ft. h., very diffuse

No. 6890. Encelia virens. Stems spreading and erect, forming a low bush, 1 to 2 ft. h. or sometimes all decumbent and 2 to 5 ft. long, as in the rocks.

No. 6905. Tridens pulchellus Hitchc. This grass grows on the dry hills. Det. A.S.H.

No. 6906. Chorizanthe rigida T. & G. Involucre membrano-reticulate between the ribs. Cauline or rameal leaves subulate or aristate! or spiny! Dry hills, common.

Cont. No. 6892. This is one of the common bushes in the wash but is mostly gone out of flower now. Scales short ovulate, placed between two lanceolate paleae (subulate-tipped). The lanceolate paleae are twice as long as the short broad (or scales) ones, but are not to be described as "awns". The bulbous-dilated cor. tube is a character to be taken into account.

No. 6907. Aristida ~~reverchonii Vasey~~ glauca (Nees) Walp (DET. B. Crampton, 1922)
This grass grew in a cañon bottom, down in the boulder-blocked wash.

Cont. No. 6902. This was coll. by Jas. Dixon who says it grew 1½ to 2 ft. h. It does not answer to any of the forms described by Hall, Compositi S. Cal. Its peduncle is not scabrous, nor pubescent enough to notice.

No. 6908. Dalea Johnsonii Wats.

No. 6909. Eucelia farinosa Gray
Two to 3 feet high. Corolla throat oblong, 2½ times as long as the narrow tube
Dry hills washes. The height

should be 1¼ to 2 ft. or perhaps 2½. Heads turned down after anthesis, so the peduncles are hooked at summit.

No. 6910. Cucurbita palmata Wats.
This cucurbit grew in the rocks which choked the mouth of a narrow cañon near Pyramid Peak, Funeral Mts.

No. 6911. Cryptanthe racemosa (Wats.) greene.
The nutlets are sparingly papillate on face, more so on back. No median line on back. Ventral line dilated into an open triangle at base.

No. 6912. Eriogonum inflatum var. inflatum
Outer perianth segments lanceolate, hairy, the inner broader. Washes and especially dry mesas, a regular forest of last years stems in places.

See p. 111.

As I walk down the Furnace Creek wash, there comes into view around a point a distant glimpse of the grateful green of the Mesquite trees (Prosopis juliflora) towards the lower end. It is a grateful sight because of the delicious green and because the mesquite is the sign of water. On the lower hills east of the Furnace Creek ranch they occur about the heads of the springs which mark the water-bearing stratum. They are, here, an infallible sign of water.

When I come into the Mesquite part of the wash of Furnace Creek I find a considerable number of annuals, Phacelia no. 6916; Mimulus no. 6888; Gilia no. 6913; Strichoseris platyphylla no. 6917; and Eremiastrum bellioides no. 6920.

I find but a single plant of the rare Phyllogonum luteolum Coville. (cf. F. B. 50: 79) It, i.e. my specimen, is a tiny individual and I did not feel sure it could be Coville's species, judging from the plate in the Botany of the Death Valley Expedition. The habit as illustrated by him gives a very different impression from that gained by looking at my specimen. But the flower structure in every detail makes it unmistakable! This is the only spot where I have found annuals, other than an individual or two, and is (Cont. p. 101a).

No. 6913. Gilia latifolia Wats.

Smells like Datura.

Corolla limb pink, rotate, small. Stamens 5, unequal.

Wash Furnace Creek.

Corolla lobes very acute, style 3-cleft at apex. Calyx-tube scarious between the sinuses its red lobes subulate, as long as calyx-tube. Stamens scarcely unequal. Abundant.

No. 6914. Oenothera scapoidea T. & G.

Furnace Creek wash. Flowers white, the calyx cup bright red inside. Inflorescence as if scapoid.

— We, Grinnell, Dixon & I, go by Ford Car, from the Furnace Creek Ranch up into the Funeral Mts. and make camp at about 2 300 ft. This is about 17 mi. from the ranch. We go where no machine ever went before, right over rough rocky country. 9 collect on this trip nos. 6901 to 6912. See also pages 109, 115, 117.

No. 6915. Mohavea breviflora Coville.

Corolla lemon-yellow, strongly bilabiate. Upper lip nearly erect, broad, equalling lower lip, shortly cleft, its lobes abruptly acute, the entire broad upper lip with a sprinkling of purple dots. Lower lip with middle lobe smaller than lateral; lip spreading but not from the sinus; that is both lips quite erect as compared with Minulus lutens. Palate of lower lip very protruded, quite high, almost like a Snapdragon flower, the depression down the palate into the throat with short stiff erect yellow hairs, at mouth of tube becoming dense and reminding one of a Calochortus gland. Capsule open only at top. Cont. p. 99

No. 6916. Phacelia calthifolia Brand. Cor. lavender purple. Filaments with a scale on each side at base, so as to make a pocket behind filament. Style slightly hairy. Ovary glandular-hairy. Herbage stains the paper!
A showy and somewhat odd Phacelia with round-subcordate leaves.

No. 6917. Atrichoseris platyphylla Gray. With its few broad frown leaves hugging the ground in a close rosette, its very slender tall stem, and its pure white flowers, — one has before him a singular and striking cichoriaceous plant.

Cont. p. 113.

Cont. No. 6915. Mohavea breviflora. Calyx-lobes equal, glandular-hairy. The very striking thing about the corolla is the erectness of the lips. The lobes of the lower lip are in a straight line, the lobes of the upper lip are in a straight line (if two points can be said to be in a line! but two plane lobes may well be). So that the two lips being nearly erect give the impression of a "compressed" corolla, compressed fore and aft! The plant is common, altho not abundant, in the wash, the length of the Mesquite zone in the wash. Three sterile stamens on upper side at base of tube, very small and insignificant and easily overlooked. Fertile stamens 2. Calyx-lobes distinct!

Furnace Creek, Death Valley. 100 ft.

6918.

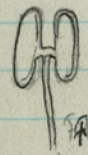
No. Chorizanthe rigida J.&G. Wash of Furnace Creek. Stamens 9. Calyx-lobes hairy on back. Ovary oblong-cylindric, as long as calyx or nearly. Stamens 9. ~~Flower on a slender~~ axillary pedicel.

No. 6919. Nama demissum Gray.

No. 6920. Eremiastrum bellioides Gray. Pappus bristles abot 5 or 6, the short paleae laciniate. Monoptilon bellioides Hall.

Cor.

No. 6921. Phyllogonum luteolum Only a single individual found. Small prostrate plant in wash, upper end Mesquite zone, Furnace Creek. Perianth greenish, its segments distinct, linear-oblong. Ovary elliptic-oblong, its styles 3, distinct, slender, nearly as long as ovary. Flower on a slender axillary pedicel, the pedicel and outside of perianth pilose. Perianth segments 6, alike, the outer 3 shorter in fruit. Achene triangular.



Filament.

Cont. from p. 95.

probably the most classic spot in the region as a botanical locality.

Further down the wash gets drier but there are still some annuals all the way to the mouth of the wash. At the mouth of Furnace Creek one can look down over the detrital fan to the plain of Death Valley. In the foreground, about one mile away, is the green grove of Furnace Creek Ranch. Around the low ranch buildings are Cottonwoods (Populus Fremonti) and Mesquite (Prosopis pubiflora). Our camp is at about the center of the main grove, a little open quadrangle bounded by trees and along one side a ditch of water, running swiftly, which

is conducted down from the water-bearing stratum in Furnace Creek. About 60 acres are irrigated and cut for hay. The work is done by Panamint Indians under the direction of the Superintendent of the ranch, Mr. Oscar Denton, who holds a very poor opinion of the inhabitants of the little Indian village near the ranch.

Our camp is a source of curiosity to the male Indians, old and young, but they are very careful to betray none. The females are curious too. Six of the young girls lined up behind a fig tree and peeked through at my doings, which concerned plant presses and their contents. But if one looked up at them, — they were looking some other way!

The girls were reasonably pretty Indian maidens, (good looking certainly) as compared with the males. Later on, in the evening, they came into the inclosure and sat on the green grass on a ditch bank by the camp. And such gigglings and laughings, — surely the sex is fundamentally the same through all the changes of race and color. Judy O-Grady and the Colonel's lady! And in the evening twilight, on the way to and at their village camp, which is close at hand, such laughing, such merriment, — shouts of play and whatnot. They certainly seemed most happy and care-free, — as I doubt not they are. I remarked to one of our party

that it was like a fiesta for merry-making. He said it was so every evening.

— Death Valley is doubtless all the most lurid writer ever sketched it. On the east side rise up the foothills of the Funeral Mts., black and white banded and spotted, above the foothills the main range with its ghastly blood-red and brown-red and dark chocolate folds and strata. And so all around. But Death Valley is not merely a hot place between two ranges. That much would hardly give it its celebrity. The streams of water issuing from Furnace Creek, the snowy tops of the Panamints on the west, the curious salt floors, — these and many more things contribute.

-Cont. no. 6895. This seems to be Stephanomeria runcinata Nutt. acc. to Hall's Compositae. Pappus plumose nearly to base. Receptacle naked. Flowers 6 in one head dissected. It is not rare in the wash, where we had our camp, being one of the common bushes of the several quite characteristic to the wash.

-Cont. no. 6902. Encelia frutescens. Cor. drawn down to a very narrow tube at base, the tube about 1/3 the expanded throat.

✓ No. 6922. Sphaeralcea rotundifolia (= Eremalche Jepson.) This malvoid plant grew in the wash. Its corolla is an inch long. I have not,

as yet, anyway, obtained a flowering specimen, having seen it in flower only from the machine in which we went up to the base of the Funeral Mts., that is above the foothills.

See p. 110.

✓ No. 6923. ~~Croton~~ Tidestromia oblongifolia (Wats.) Standl. Common

✓ No. 6924. Polypogon monspeliensis (L.) Desf. Probably an introduction. Det. A.S.H.

✓ No. 6925. Cyperus laevigatus L.

✓ No. 6926. Salix ~~nigra~~ gooddingii var. vallicola (Dudley) Ball 6 to 15 feet high. Salix Gooddingii Det. C. Schn.

✓ No. 6927. Tamarix Thriving and thoroughly at-

home in the Furnace Creek wash. 12 ft. h. Used as a sun-variant wind-break at Furnace Creek Ranch.

No. 6928. Chaenactis

flowers white. Also occurs in Hanaupah Canon, Panamint Mts!!

No. 6929. Chorizanthe rigida

Same as 6918, q.v.

No. 6930. Encelia

This single individual illustrates the paucity of the flora this dry year.

No. 6931. Oenothera scapoidea T. & G. Flowers yellow.

— In the washes nearer the base of the Funeral Mts and all the way down these washes something over half-way to the base of the foothills, the dominant shrub, to the

eye, anyway is no. 6875 (Pencephyllum Schottii gray), because of its deep dark green color and its size. It makes rounded bushes 3 to 5 feet high and broader than high. The well-developed shrubs which have just reached maturity are beautifully rounded and symmetrical. The older bushes become less regular and more open, their heavy main branches crooked and rough, so that they look not a little like old spreading oak trees on a small pattern. Throughout the upper portion of the foothill washes it is the common shrub. Its wood is very

Furnace Creek, Death Valley
-100 ft.

hard and as it held its heat well and made fine coals we used it exclusively ~~for~~ camp-fire kitchen when stationed at the base of the Funeral Mts, at the ↑upper limit the foothills.

-The common shrubs in the wash near the upper foothill camp (cf. p. 96, note at top of page; were!

- Peucephyllum Schottii Gray no. 6875
- Bebbia juncea Greene, no. 6887.
- Vigueria reticulata Wats. no. 6892
- Franseria dumosa Gray no. 6900.
- Stephanomeria runcinata, no. 6895 Nutt.
- Hofmeisteria pluriseta Gray no. 6885
- ~~Franseria dumosa Gray, no. 6896.~~

— Lepidium Fremontii also grew on the banks of washes, but was not common near the foothill camp.

No. 6932.

Death Valley Sink

No. 6933. Eriogonum ~~trichopes~~ trichopes

Per. segments triangular-lanceolate, yellow. Involucre 4-Toothed, 2 to 5-flowered, glabrous. Perianth densely pubescent with short straight hairs on the outside. Nodes and a short zone above with bracts glandular with gland-tipped hairs! making a glandular band. Wash of Furnace Creek.

— Cont. no. 6922. Petals near Lidalea color, with a large red-purple spot in center, like an eye-spot. Bracts 3, linear-filiform., they eye-spot is below middle of petal. This

plant has few round leaves. They spread out perfectly plane and at right angle to the sun's incident rays. They curl very quickly on the plant being taken up and are so prompt that it is like the sensitive reaction of a Mimosa leaf. Some desert plants reduce the size of their leaves; some reduce their number. This species being an annual it is preferable to reduce the number.

— The extreme localization of species referred to elsewhere (see p. 123) may be due in part to the lack of rain this season. Denton says that never in his 13 years experience has there been so little rain in Death Valley as this year.

No. 6934. Prosopis pubescens Bth. Corolla pale yellow, the lobes markedly connivent 3/4 the way up, forming a distinct tube. Calyx narrowly bowl-shaped, with 5 very low teeth. Stamens 10, exserted. Ovary woolly.

— Prosopis juliflora DC. Corolla dull white, the petals oblong, acute, clawed, quite distinct. Calyx low, narrow bowl-shaped, with 5 very short acute teeth. Ovary pilose, on a stipe. Perhaps the two above Prosopis species were better in separate genera.

A cluster of juliflora pods may come from

a single spike, or may represent the spikes of an axillary cluster.

– Cont. no. 6917.

Involucral bracts linear, acute, 10 (in one count), equal, with a series of very short ovate ones at base. Leaves thickish, sometimes green, but mostly brown. Scape probably always solitary unless mutilated. Rays with pink teth. near Base of corolla, just above achene a little, an annular glandular-pubescent swelling. Flowers rather few. One may properly say there are only basal leaves; and scale-like

bracts of the inflorescence.

Bracts of the involucre, 10, 10, 10, 10,

Flowers in head, 15, 15, 11

Scape always solitary, unless mutilated.

– Prosopis juliflora. In full flower now. The abundance of straw-yellow flowers quite transform the appearance of the trees. The bees buzz around the trees in numbers. Putnam the prospector says there is no honey so clear, fine and delicious as that from the Mesquite. Hence Honey Mesquite.

– The hooked fruiting pedicels is a marked feature of Eucelia farinosa No. 6909 and should not be neglected. I do not notice mention of it in the books.

Death Valley 2300 ft.

(see p. 96)

-Near our camp at foot of the Funeral Mts. I noticed fairy circles of Eriogonum trichopodum Torr. on the red hills. I am not able to account for the regular arrangement. Circles about 6 to 8 feet across. A bush might have stood in center and disappeared but it was not evident. The soil in the center might have become exhausted, but it would seem the seeds would readily drift further. It might be caused by an old antihill. These have a center which is quite different from the band around the edge. The bounding band looks to the eye a good deal like some fairly well rotted cow or barnyard

manure. The materials are derived by the ants from Atriplex hymenelytra, on which the ants feed. In one place I noticed that this atriplex was the only plant in the vicinity. Moreover I could make out the bracts of this species about the hill. The trouble with this theory is that I saw no signs of antihill about the fairy circle, altho it might have been rather old, or even very old. Time is nothing in Death Valley! The species was certainly Eriogonum, but being only the dried stems of last year may not have been trichopodum, but I judge it was.

— Desert water. Quail require water and are probably never found far from water. Desert mice, says Grinnell, make their own water. They consume starch, and water is a metabolic by-product. They undoubtedly get water from certain plants in some seasons.

A rock-pile, the home of Neotoma desertorum, a wood-rat, was pointed out to me by Grinnell. His domestic arrangements were remarkable. He had ornamented his entrance ways with small stones, all about of a size, which he had brought from the mesa. The stones were about 1½ inches across. Also he brought in and put in rows the droppings of burros. These have a definite shape and gave a certain symmetry and order to the place! We saw two defecatoriums, for he always defecates in a certain place. This rock-pile was the home of the rat, only one, unless a female with young. The male and female do not live together as trapping proves. On the runways between their homes one may trap two or three rats, but only one at the home.

Birds require water. We went to the mouth of a great cañon to get a rock-wren. No spring was near, but I found water in the pot-holes in the rocks. Grinnell says

Death Valley, 100 ft.

no square mile is without a spring; springs which only the animals know. I doubt if springs as a spring can be found in every square mile, altho it might in the highly mountainous parts.

No. 6935. Charizanthe rigida J. & G.
Furnace Creek wash. 100 ft.
May 4.

No. 6936. Eryptantha inaequiata Jtn.
Furnace Creek wash. May 4.

[— Sisyrinchium funereum Bicknell. I have dissected 3 fls. and find the style quite entire. Material of #6872. — Sept. 11, 1917.
The drawing on p. 74 shows entire style but I wished to confirm. See p. 159.

— Today I saw Panamint Tom. He is of the older generation of Indians and is the only one of the older type left about here. He dislikes the whites strongly, with an intensity of feeling which the younger men cannot know. He has seen them dispossess his people and file claims on springs at which the Indian has camped and lived for ages. The treatment of the Indians of the Panamint Tribe is only another page in the shameful chapter to be charged to the whites.

Panamint Tom has a relative in Hungry Bill, who is a brother. Hungry Bill's ranch near Sentinel Peak is marked on the U.S. topographic map.

Death Valley.

– Furnace Creek on leaving its cañon spreads out over the floor of Death Valley, having built up a great detrital fan forming a sloping semi-circle about 5 miles across. At the base of the rubble fan begins the fan of finer, or sandy, sediment which makes a band about ½ mile wide. On this occurs the Mesquite (Prosopis juliflora), forming thus a great semi-circle, a band about ½ mile wide, from the base of the foothills south of the entrance of Furnace Cañon, extending in a curve out over the valley and around to the base of the foothills north of

the cañon. I walked through this grove of Mesquite in the direction of the Death Valley sink and the further I went the more prosperous seemed the Mesquite, while the salt-concentration was evidently becoming greater. Only three plants extended out in the direction of the sink:

1. Prosopis juliflora
2. Pluchea sericea
3. Distichlis spicata

All were abundant. The last extended the furthest and the Pluchea next, this hardly further than the Mesquite. In this locality were a few isolated plants of Suaeda No. 6932.

The bush on the rubble at base of fan is Atriplex hymenelytra Wats.

– It is certainly very remarkable, the extent to which plants are localized in this region. One looks at it, the desolate extent of mesa and mountain, it looks alike in its utter aridity and nakedness. Heat, cold, insolation, dryness seems to operate over the whole region simultaneously and uniformly. But every little area has its species of plants and one does not find them elsewhere or at least not locally. (Cf. p. 111).

– Coult. no. 6898. Boerhaavia annulata. Its young shoots are very succulent and tender. They are full of water and are so brittle that they break off very readily at this time

when they first come up. It is the most brittle desert plant which I have met on this trip.

– Cont. no. 6870. Forming low rounded plants like Eremocarpus setigerus. Outer involucral bracts with recurved tips. Achenes densely white-hairy. = Psathyrotes ramosissima Gray

– Grinnell & Dixon are hunting Mountain Sheep (Bighorn, – Ovis Nelsoni), – in the Funeral Mts. We find the sheep trails, probably followed for ages, and often see their droppings. One day Grinnell found fresh faeces, that is, dropped since the rain, because they were still shiny. They are characteristically pointed at one end and with a little depression at the other. Dixon found their beds, and since they urinate in bed, it is possible to tell whether the beds have been occupied recently. We saw not a sheep during our stay at the base of the Funeral Mts.

Death Valley } Furnace Creek to Eagle

125 — Left Furnace Creek Ranch at 12 noon, going south across the detrital fan of Furnace Creek. The only plant of the rubble of the fan is Atriplex hymenelytra. Beyond the fan we run past an area of Suaeda bushes, probably S. suffrutescens. Then we cross about three miles of "self-raising ground" which looks not unlike a deeply plowed field on which heavy rain has fallen for two or three days. It is very rough and very hard on the machine. Then we come to an area of Salicornia, No. 6942 = Spirostachys quite extensive, bushes 1½ to 2½ feet high and twice as broad, with woody stems one inch in diam. at base. It is

Borax Works. May 4, 1917 126

truly remarkable how we run into associations of different species — the associations being pure.

We camp at the "Eagle Borax Works", a green spot with the following plants: —

No. 6937. Phragmites communis Trin. ~~vulgaris A.S.P.~~ This reed is abundant and 5 to 8 feet tall. Eagle Borax Works. = P. communis Trin.

No. 6938. Sporobolus airoides Torr. This grass is 3 to 5 ft. high, the leaves forming heavy tufts 2 ft. high; with very dense crowns, very dense and difficult to work into at all with a botanical pick. The plants form hummocks, the heavy dense base of the hummock being about one foot above the level of the

See p. 129.

flat. The tops, when burned off, show the very heavy and densely woven mass of stems. This species is very common here. It is, I think, the same species as at Independence and Lone Pine. The panicles are medium-sized and have wholly lost their flower seeds and mostly their glumes as well. This grass grows on the alkaline flat about the borders of the marshy swales which may be described as diminutive "sloughs". Cont. p.

These "sloughs" are filled with No. 6937 (Phragmites vulgaris) and No. 6939 (Scirpus Olneyi). Also there are stretches of Anemopsis californica more luxuriantly flowered than I have ever seen it elsewhere and as much as

two feet tall! Then there are colonies of No. 6940 (Apocynum cannabinum) in the swales. These four, the hemp, the tule, the reed, are the water plants. Some water lies along the surface of the little sloughs, enough to wet one's shoes a little in crossing. In order to get water for the camp readily I dug a pit – a foot and a half deep and the water filled it promptly. The tule and the reed are certainly water indicators. Doubtless Yerba Mansa is also, – of alkaline water anyway. Denton called this Yerba del Manso, and spoke of it as invaluable for cuts and sores in horses. It has a strong, pungent and somewhat disagreeable odor.

There is a band of Mesquite down this (west) side of the valley following the water-gravel beds

doubtless of the washes from Trail, Chuckwalla ("Death Valley Cañon" of the map), and Hanaupah cañons. The Black Mts., opposite us, rise sheer from the valley floor without intermediation of foothill, or mesa, or even talus of any moment. Their bases proper are just at sea-level.

The altitude here is 250 feet below sea-level. There is nothing however to indicate it. The swales are lively with the white Anemone-like flowers of Anemopsis californica, there is the rasping trill of Bullock's Oriole, and the soft and almost plaintive or dove-like call of the Roadrunner hidden in the Mesquite.

— Cont. No. 6938. Is this the "Zacatone"? Yes, of the central Mohave; i.e. the name used at Barstow.

See 27: p. 55

— 260 ft. May 5, 1917. Inyo Co.

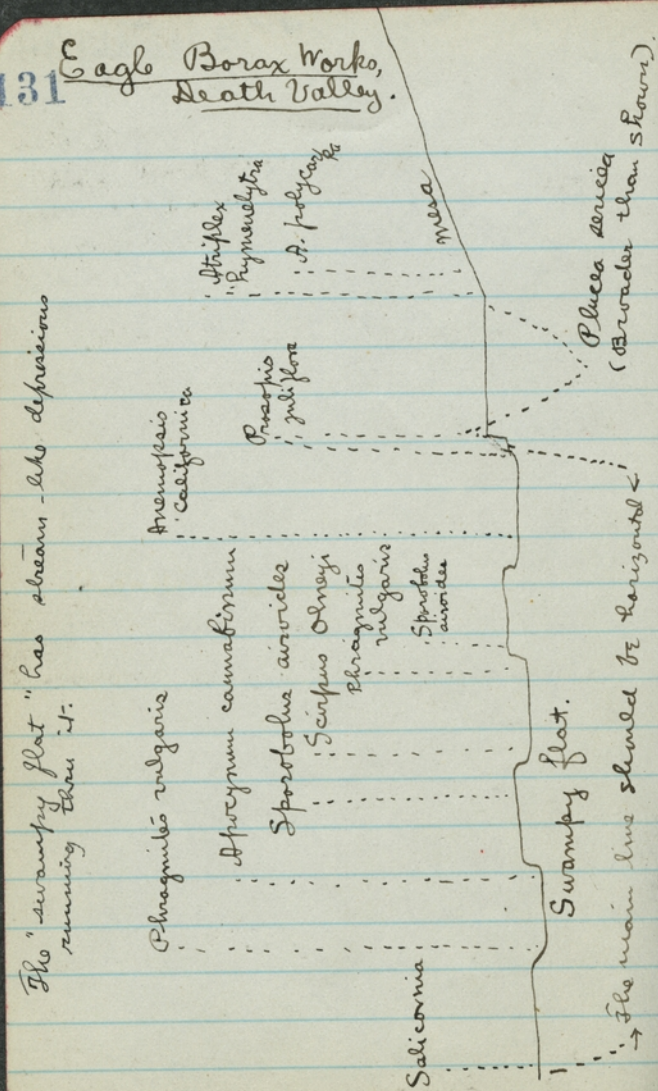
No. 6939. Scirpus Olneyi Gray. Stems triangular, fluted between the angles, 3 to 6 feet high. The base of the plant sends out underground runners or rootstocks which give rise to shoots at scaly intervals, such nodes becoming short swollen tubers, globose, but very hard. See p. 127. preced.

No. 6940. Anemopsis californica* Hook. Filling the swales. See p. 128 and p. 129 preced. Its runners form a tangle on the ground. Stamens 6 or 5. Bracts mostly 6. Cont. p. 2

No. 6941. Apocynum cannabinum L. This hemp grows in the water or moist swales. The cyme terminates the main stem or there may be 1 or 2 extra cymes on short subterminal branches, in any event the leafy branches always exceed the terminal cyme or cymes, i.e. they are proliferous beyond them.

* The most luxuriant growth I ever saw. A pure growth also.

Eagle Borax Works, Death Valley.



– 260 ft. May 5, 1917 Inyo Co.

– There is an abundance of feed for animals at this point and sufficient water. There is wood and very good shade given by large mesquite trees

– As generally in the valley the salts glisten on the surface, in places like cakes of smooth ice, or elsewhere like frosting, or coraline formation.

✓ No. 6942. Salicornia = Allenrolfea occidentalis = Spirostachys occidentalis Wats
Very shortly jointed branches, moniliform.

✓ No. 6943. Juncus Cooperi Engelm.

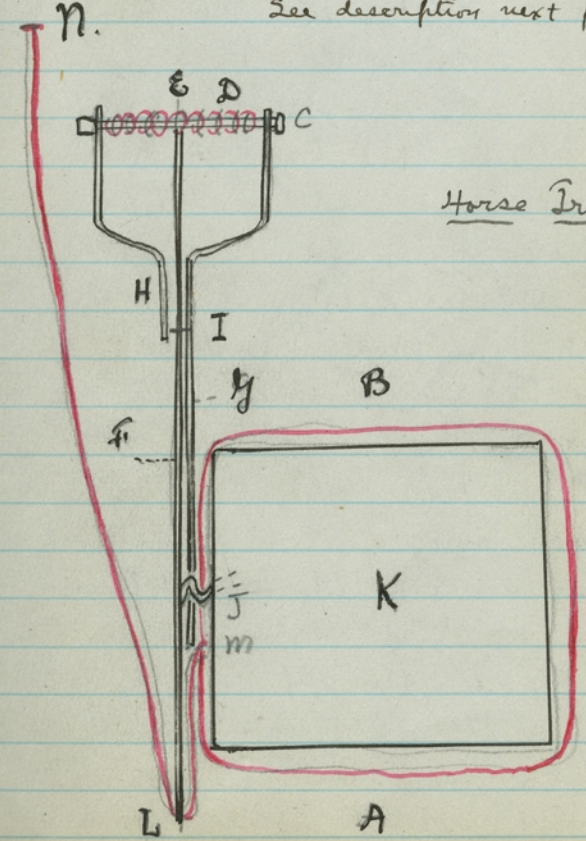
– Cont. No. 6940. Ovules to a placenta: 9, 7, 10, 8, 8.
Stems not hollow. I have run my eye over several spikes and find the styles 3, no 2s. These leaves are the average of the larger size.

Eagle Borax Works, Death Valley. -260 ft. May 5, 1917.

– There were something like 35 or 40 loose and mostly wild jackasses at this place when we came up. Some Indians, amongst them Panamint Tom, camped here last night. One of the Indian jacks wandered off with the loose ones. It was interesting to observe the manner in which they caught it: All the mounted on Indian ponies they did not attempt to catch it out on the mesa. They drove the whole band of jacks up to their camp, herding them in close; then they suddenly dashed in from several sides, scattering most all the wild jacks but holding in the center the jack wanted with one or two others. An Indian girl then dismounted, walked up to the jack (which stood perfectly still) and put a rope on his neck.

A prospector named Putnam joined us for a few days. He has the most ingenious trap for catching wild horses that I ever saw. at Furnace Creek.

See description next page –



Horse Trap.

To one who is so much concerned with the loss of animals on a scientific expedition the trap is of especial interest. It is set alongside the trail. The trigger is covered by a board 8 inches square which lies right in the trail. A heavy stone is placed in the trail either side the board so that the animal will be forced to step in that particular spot. A rope runs round the board with a slip noose at M, the end of the rope passing to a heavy weight, log, etc. at N. Between M. & N. the rope is lightly tied with a string at L to the tip of the long straight iron rod which the trigger releases and which flies upward

and backward, raising the noose about the horse's leg and at the same time tightening it. The rod being jointed the rope is readily pulled off the end of it, as it naturally, by its weight, pulls away from the rope when its work is done. D is the heavy spring. HG is the main iron frame of the trap which rests on the ground. The whole trap should be concealed by horse dung or in some similar way. Dixon says that the noose should be so fixed that as its slack is taken up it cannot loosen.

– Teratology. See no. 6945.
See vol. 34, p. 3.

Eagle Borax Works, Death Valley. May 5, 1917.

= P. glandulosa var. Torreyana

No. 6943a. Prosopis juliflora DC. var. glandulosa Torr.

The pods have a tendency to set on one side the spike. About Furnace Creek I noticed only 1 to 6 flowers setting, but here as many as 18!

I measure one tree 66 ft. broad and 20 ft. high, an average of the larger ones. Altho so low, they have after all a certain dignity imparted by their very broad bases.

No. 6944. Boerhaavia annulata Cov. Fls. as many as 12 in a cluster. Lower part Hanaupah Cañon. 2500 ft.

No. 6945. Larrea tridentata Cov. var. glutinosa Jepson. Whole shrub with flowers having supernumerary petals, viz. 8, 8, 8, 9, 9. Lower part of Hanaupah Cañon. 3000 ft.

No. 6946. Datura meteloides DC. Lower part Hanaupah Cañon. 3000 ft.

Trail to Hanaupah Cañon, Panamint Mts. May 6, 1917.

Lime Cor

The wash of the lower part of the cañon has essentially the same species as in the Funeral Mts.

The species are as follows:

Psathyrotes ramosissima
Viguiera reticulata
Physalis (=No. 6893) = P. crassifolia
Encelia virens
Mimulus (=No. 6888
Pencephyllum Schottii (=No. 6875)
Baileya pauciradiata Greene (=No 6887).
(=No. 6894)
Stephanomeria runcinata (=No. 6895
Franseria dumosa Gray (=No. 6896)
Atriplex hymenelytra
Larrea tridentata
Boerhaavia annulata
Mohavea breviflora Cov.
Aster tortifolius
Chorizanthe rigida
Dalea Johnsonii Wats. (= No. 6908).
Encelia farinosa Gray.

Hanaupah Cañon
Panamint Mts.

Cont. —

Eriogonum inflatum
Dixon called attention to the insect stung inflations as a cause of the inflation, but I showed him several which were not insect-stung!

Eremiastrum bellioides
Croton (no. 6923).

The validity of the names in the above list depends on the identic species listed for the Funeral Mts. Rarely am I able, on account of the time factor, to recollect at stations so near.

No. 6947. Oenothera cardiophylla Torr.
Stems several from the base, erect or ascending. Flowers yellow, but turning a lively brick red on drying. Wash. Lower cañon.

No. 6948. Eriogonum rixfordii
Wash. A singularly regular vase-shape, with the series of branchlets above tending to be stratified. Lower cañon. See vol. 34, p. 39.

No. 6949. Lepidium Fremontii Wats.
Lower cañon.

alt. 4000 ft. May 7, 1917. Inyo Co.

No. 6950. Lupinus excubitus Jones.
Very showy and very floriferous; cf. p. 201. These shrubs or bushes, 3 to 4 feet high and 4 to 8 feet broad, crowned with hundreds of racemes, make a fine spectacle in the wash. also occur on hillslope. Flowers pale lavender-blue, the center of banner yellowish with a few faint dots on lower part. Keel ciliate above. Upper calyx-lobe shortly cleft, lower entire apparently but probably very obscurely 3-toothed, tho' not obvious under a field lens. Yellow spot turning dark purple.

No. 6951. Encelia
Achenes flat, hairy margined. Corolla throat bulbous at base just above the short narrow tube proper. Lower Cañon

No. 6952. Cowania Stansburiana Torr.
This rosaceous bush is 9 feet high, scraggly, and spreading with twisted branches; but

Havasupai Cañon, Panamint Mts.

every square inch almost of its surface covered now with blossoms, a dull but even white. Petals obovate, rounded at apex. Stamens broadly numerous. Pistils 5. Flowers solitary and terminal on short leafy branchlets. Corolla rotate. Leaves spotted above and on the margins with mostly whitish gland-dots. Trunk 9 in. diam at ground; 8 in. at 2 ft. above, Bark shreddy, brownish. Better say cream-white corolla, the cream pale. Pistils 5; ovary glabrous, 1-ovuled, stipitate; style surrounded by a heavy tuft of straight ascending hairs, the stigma or stigmatic portion projecting. See p. 146.

No. 6953. Baccharis sergiloides Torr. Common in the wash, at places abundant, and 4 to 6 or 7 ft. high

May 7, 1917. 4000 ft. 142

Inyo Co.

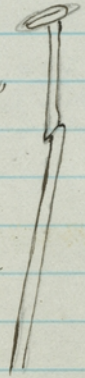
No. 6954. Senecio douglasii DC. Rounded bushes 15 to 21 in. h. in wash. Also occurs on hillslope.

No. 6955. Astragalus mohavensis v. Wats. Pods very fleshy at this stage. Stems prostrate

No. 6956. Mimulus bigelovii Gray. Det. A.L.G. Band in throat yellow. Corolla red-purple. See p. 196.

No. 6957. Salvia Dorrii ssp. argentea ~~canosa Dougl~~ Cor. deep rich blue; upper lip cleft, its lobes erect; lower lip with the lateral lobes curving in such a way and approximate to broad upcurved middle lobe as to form a shallow bowl-shaped structure. The middle lobe is rather larger, crenulate, notched in middle

Tube of corolla hairy within. Stamens 2, on the lower lip. Fils. jointed very distinctly but no trace of a lower anther half.



Calyx: upper lip broad, truncatish, with 3 short teeth in the middle. Lower lip: lobes obtuse with an acute point, and cleft more deeply than the sinus between the lips. Style glabrous.

Stems decumbent (prostrate with ascending ends.

No. 6958. Brickellia multiflora Gray.

From two feet or 8 feet high, many stemmed and disposed to be erect rather than spreading.

Leaves lanceolate, markedly triangular shaped as one sees them in the field. Very gummy. This is common in the wash from a point about 2 mi. above cañon entrance to camp. It comes in above the tall Chrysothamnus (No. 6988.)

See 6959

See next vol. p. 13.

No. 6959. Chrysothamnus paniculatus (Gray) Hall *

This does not seem common. It is 4 to 5 ft. h. Very resinous. gummy. Leaves linear or filiform. The branches and branchlets revolute more than one season old are somewhat bluish with a waxy-white substance (the dried resin). See 6988

* Common about camp at 4600 ft.

No. 6960. Galium stellatum Kell.

Pets. 4 stamens 4. Common on the rocky slopes, 4000 to 8000 feet.

Hanaupah Cañon, Panamint Mts. 4000 ft.

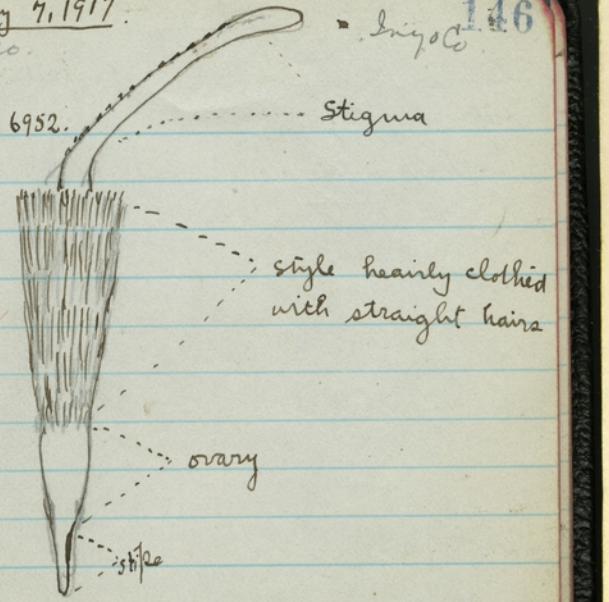
No. 6961. Pentstemon fruticiformis Gov. Cor. white with pale lavender lobes. Upper lip of 2 short erect lobes. Lower lip spreading downward (i.e. recurving somewhat). Cor. tube as if inflated, because much enlarged, the proper tube short. Sterile stamen pubescent, hairy at tip. Fertile stamens + style glabrous, or obscurely and minutely glandular-pubescent in at base. Cor. throat abruptly and much-enlarged above the short tube. See p. 160. Herbaceous, only slightly woody at base.

No. 6962. Cryptantha barbigera Greene. This borage was found in the wash. = var. inops (K. Bag.). = C. nevadensis Nels. & Kenn.

No. 6963. Oenothera caespitosa Nutt. (Cont. p. 187) Buds very large and strongly 4-sided. Capsule rough-walled. Stem Axis very short, right on the ground, with few short branches, the whole (Cont. p. 148.

Inyo Co. Inyo Co.

Cont. no. 6952.



Shrubs 5 to 9 ft. h., mostly on the cañon walls.

This must be Bowania mexicana of Bot. Cal., but B. Stansburiana Torr. These shrubs differ from the description in Bot. Cal. as follows:

Stigma not "terminal".

Carpels "densely villous"; but only the style is villous.

Hanaupah Cañon, Panamint Mts. 4000 ft.

Flowers pale cream-white, not "yellow". Tube of calyx very narrow-turbinate. Carpels stipitate, not "sessile"; the stipe is short, but distinct. No bractlets. Carpels 4, 4, 5, 5, 5, 6. Profusely flowering and very effective on the cliffs.

No. 6964. Composite. Wash, but also on hillslopes.

No. 6965. Rhus trilobata Nutt. Wash. Low, spreading.

No. 6966. Clematis ligusticifolia Nutt. Forming part of the tangle in the cañon bottom at this place.

-Cont. No. 6963. rosette-like. Corolla white, fading pink. Wash of the cañon.

No. 6967. Euphorbia schizoloba Engelm. = E. incisa Engelm.
Forming a low bush (1 ft. h. and 1½ feet broad), its numerous stems forming a dense tangle, much interwoven, because the new growth each year comes up thru the old persistent growth, which only in part is turned down to the ground. Glands 4, at first greenish, later pale salmon, finely toothed with the 2 teeth on each side the larger. Stamens plainly jointed on their pedicel, the filament about half as long as the pedicel. Involucre with several scarious filaments. Stigmas 3, each deeply divided.

– We (Dixon, zoologist and his assistant McQuesten, and myself) came up into Hanaupah Cañon on May 6, camping at about 4000 ft. where the cañon forks. A stream of water, 4 ft. wide and 4 to 6 inches deep, flows rapidly by our camp, making a sound which is very cheerful in contrast with the conditions in Death Valley.

The willows (Salix no. 7081) begin at this point. In the bottom of both forks above there is a considerable tangle of vegetation. The Clematis (C. ligusticifolia Nutt.) runs over shrubs and trails about, along the stream. Vitis, no. 7099 girdiana Munson is here; up the left-hand fork 1/3 mile there is a narrow flat covered with it, perhaps an acre, mixed with Baccharis no. 6953

and Clematis, but the grapevine predominating.

The right-hand cañon has the larger stream and the more abundant cañon bed vegetation. This stream issues from a dry hillside about a mile up, a spring which is not named but is marked on the map.

The top of Telescope Peak is visible from here. In a way, it seems farther off than when we looked at it from the Eagle Borax Works. In an air line it is not so far away, but some 6500 feet above us, so that the slope is very abrupt. In fact everywhere here the cañons have very steep walls. Our camp is below the Juniper belt, which we can plainly see above us. After the Juniper, comes the Piñon belt

Hanaupah Cañon, Panamint Mts. 4000 ft.

very sharply defined indeed, and above still, in the snow, are the pines.

– The cañon from camp to the big spring a mile above is very remarkable for the vegetation in its bottom: Vitis girdiana (No. 7099) everywhere, and making vineyards on the lower slopes; Salix No. 7081, all along the stream; the characteristic stream bed Composites (Baccharis sergelioides, No. 6958 Chrysothamnus No. 6959; and to.

Clematis ligusticifolia climbing over the willows and shrubbery generally; Phragmites vulgaris; the great Sedge No. 7002. And at the head of it all the stream gushing out of a rocky hillside in one spot, making a cascade and a series of such below as it descends the rocky wall of the cañon.

– Salazaria mexicana.

In bud. Hillsides. 3 ft. h. Common.

✓ No. 6968. Phacelia distans 8th. Corolla pale blue. A scale, undulate erect, proceeds from the base of each side of each fil. and approaches or rather covers the tip of the corresponding scale from the adjoining fil. The filaments thus appear to set in a sort of open "sac". Just above the "sac" are scales ("sac" is hardly the term, or "cup" either) is a round semi-transparent spot behind each filament. Style divided nearly to base, the short undivided portion and the ovary hairy, especially the upper portion of the ovary. On reexamination under the dissecting microscope I find the ovary is about equally hairy all over!

Hanaupah Canon, Panamint Mts. 4000 ft.

No. 6969. =Cryptantha Oreocarya virginensis Mcbr.

This borage grew in the wash and presented a very whitish appearance and a very squat appearance. The largest specimen I noticed was 14 in. h. Stamens with very short filaments inserted at mouth of tube. Often only 6 in. h.

No. 6970. Castilleia angustifolia G. Don. 4200 ft.

Showy on the hillslopes, Calyx shortly cleft before and behind; its lobes shortly vacutely cleft. Galea with a ciliate band on back. Ridges of sacs somewhat saccate-channeled intermediately and exteriorly. It enlivens the hillslopes up to 7500 ft. anyway but much smaller (6 in.) at higher elevations. See no. 9009.

No. 6971. Ephedra ~~nevadensis~~ ~~Watts~~ ~~Cov.~~

Intricately branched pale green bush. Branchlets twiggy-fascicled about ends of stems. Stamens:

6, 7, 8, their short filam. soon joined into a flattish column which is set in a perianth. Perianth shortly 2-lobed, the lobes roundish or very obtuse. Perianth compressed, i.e. fore and aft. Fruits 2 in a place, with keeled backs.

No. 6971a. Ephedra viridis Cov.

Higher up.

No. 6972. Eucelia

I think this must be a var. named by M.E. Jones. Its rays are conspicuously revolute in such a way as to appear tubular, in fact are tubular towards the upper half in the sense of revolute-tubular. Habit the same as Eucelia frutescens. 3 ft. h.

No. 6973. Oenothera brevipes Gray. Cor. yellow.

Hanaupah Canyon, Panamint Mts. Inyo Co. 4000 ft.

No. 6973a. Phacelia frementii Torr.

No. 6974. Juniperus osteosperma Little

No. 6975. Eurotia lanata
Hillsides.

No. 6976. Oenothera alyssoides var. decorticans Jepson.
Hillsides. Cont. p. 195.

No. 6977. Delphinium parishii Gray.
Hillsides. Flowers sky-blue.
(D. coelestinum Rydb.)

No. 6978. Grayia spinosa Moq.

No. 6979. Mentzelia albicaulis Dougl.
Flowers golden-yellow. Calyx-lobes persistent, rotate on the

capsule.

No. 6980.
This grew in the wash. A single plant. I am not certain the leaves belong to flowering stem, but they arose from around its base.

No. 6981. Eriogonum
Only the new leaf rosettes of this year's growth are to be had now as living material. The dead stalks of last year, 8 ft. h.! and with very ample gracefully open panicles, are sometimes still standing in the wash. The later leaves of the rosette are more pubescent and less fleshy than the earlier ones. I saw last years leaves as much

Hanaupah Canon, Panamint Mts. 4000 ft.

as 20 in. long.

No. 6982. Poa scabrella Benth. This grass grew in the wash.

No. 6983. Chrysothamnus nauseosus var. speciosus (Nutt.) Hall. This shrubby composite grew in the wash; 3½ ft. h.; genuine switch plant at this time, although new leaves are coming (which are resinous sticky). Branches grayish white and somewhat cassia-like. Old or dead stems forming a dense barrier below.

No. 6984. Cryptanthe decipiens, Hel. Wash.

No. 6985. Cryptanthe pterocarya (Torr.) Greene. Wash.

No. 6986. Cryptanthe utahensis (Gray) Greene. Wash.

No. 6987. Lycium andersonii Gray. Water-jacket. 3 ft. h.

No. 6988. Chrysothamnus teretifolius (D. & H.) Hilg. This grew in the wash with No. 6959. It seems exactly like it except in a very much smaller panicle which is set down in the foliage. Both the above, however, differ markedly from No. 6958 in this particular (as well as others). The new growth of leaves now starting tends to overtop the old panicles in the first two; that is the stems remain alive right up to the heads or very nearly. In 6988 the panicle and its peduncle dies and the new leafage starts for

Hamampah Cañon {Panamint Mts.

below it. No. 6959 seems less resinous dotted on the foliage than 6988.

The habit of 6958 is rather clean; the stems tend to be erect and there is no barricade of old stems about the base — or very little if any.

Nos. 6959 + 6988 are of similar habit in this respect, but not so markedly free from old stems.

No. 6988 also grows on the slopes

[— Sisyrinchium funereum Brick. nell. No. 6872. See also p. 119. The style is entire, but there are 3 microscopically minute stigmas!!!
— Berkeley, Sept. 20, 1917.]

Flora of the Hillslope at Camp.

— Salazaria mexicana
— No. 6969
— Castilleia No. 6970
— Eurotia lanata
— Grayia spinosa
— Pentstemon fructiformis Gr. No. 6961.
— Delphinium No. 6977
— Stephanomeria runcinata, white + dry at this time.
With numerous wish-bone branchlets.
— Galium No. 6960.
— Eriogonum fasciculatum var.
— Senecio No. 6954
— Lupinus No. 6950.
— Aster tortifolius (Gray).
— Chrysothamnus No. 7086
— Franseria dumosa

Hanaupah Cañon { Panamint Mts.

5500 ft.

[Cont. from bottom p. 85. We (Grinnell, Dixon and I left Furnace Creek ranch on this trip apr. 30. Very likely we struck up a wash into the Funeral Mts. from the lower part of Furnace Creek. We worked up the wash ten miles, no road, over the terrain where no vehicle had ever been before. Only one night was spent in camp at a point about 2400 feet. This could not have been on the "Echo Canon" wagon trail because there was no road and no sign of ever having been one. Returning on May 2 we did not follow the wash in quite the course of coming up – the wash is well spread out and consists as it were of interlacing parallel strands. At one point on homeward track we barely grazed through great great boulders on either hand. – Between 8-28-40]

– The rankness of the vegetation in the cañon bottom is a surprise. Still, there is the first essential, – water, – flowing in the bottom. The willows at base camp probably mark the limit of summer flow. Clematis ligusticifolia and Vitis No. 7099 abound and are luxuriant. The fall flowering, judging from the young growth is probably richer than now. There are dead thistle stems, a truly fine and stately growth up to 11 feet high! (See No. 6981). On the slopes the flowering is now very good. On account of the low humidity of the atmosphere the odors are marked. The air is sweet with the drowsy perfume of Lupinus (No. 6950) and enlivened by the pungent aroma of Salvia (No. 7001).

May 8, 1917. Inyo Co.

No. 6989. Dichelostemma pulchellum ~~Brodiaea capitata Benth.~~

Stamens with anthers 6, each with 2 distinct lanceolate appendages, the whole approximate in center. Hillslope. Fls. pale blue; heads loose. Looks unlike the coast form. Rocky slope scattered individuals.

No. 6990. Dudleya saxosa (Jones) ~~Brit. Rose~~ Cotyledon

Whole plant above rosettes red. Cor. sulphurish-yellow. Flower obconical with slightly spreading petal tips. Rocky slope.

No. 6991. Cymopterus panamintensis C. & R.

This umbellifer grew on rocky hillslopes. Ribs on back winged, the lateral wings coalescent with those of the other carpel. Cremocarp in outline of cross-section = broadly elliptic, the commissure at right angles to the long axis of the ellipse, i.e. the fruit slightly obcompressed. Leaves

Hanaupah Cañon, Panamint Mts.

Inyo Co.

remarkable for their sharply lanceolate divisions

No. 6992. Artemisia ~~tridentata~~ arbuscula csp. nova Ward.
Shrubs mostly 12 to 15 in. h.
Ridge north of cañon. 6000 ft.

No. 6993. ~~Haplopappus~~ linearifolius var. interior (Cov.) Jones.
Woody bush 15 in. h.
Rays 4, 5, 6, 8, 11, 12 — mostly the larger numbers. 5500 ft.

No. 6994. Opuntia ursina Weber
Clustered, spreading, low. "Leaves" growing from the tip of one another. Fl. Buds 1 to 4 on the summit of each "leaf".
Ridge north of cañon. 6000 ft.
= O. erinacea Engelm. (Det. S.B.P.).

no. 6994a. Opuntia erinacea var. ursina Weber.

May 8, 1917.

= A. purshii var. longilobus Jones

No. 6995. Astragalus inflexus Dougl. var. floccullatus Jepson = var. ordensis Jepson.
Banner notched, turned backward at an angle from the calyx which long-cylindric. Banner pink-purple with a white blotch in center. Keel and wings red-purple, shorter than the banner. Wings narrow, curved inward at tip. Banner except white center fading blue. Fruit white-woolly.
Ridge north of cañon. 6000 ft.

No. 6996. Pinus monophylla Torr. & Frem.
Trees 10 to 15 or even 25 ft. h.
Ridge north of cañon 6000 ft. See set of cones also.

No. 6997. Phoradendron
On Juniper. Ridge north of cañon. 6000 ft.

= S. hystrix (Nutt.) J.G. Smith A.S.H.
No. 6998. Sitanion minus J.G. Sm. Det. A.S.H.
This grass grew on the rocky ridge. 6000 ft.

Hanaupah Cañon, Panamint Mts. Inyo Co. 4000 ft.

No. 6999. Astragalus inflexus ✓ Prostrate. Rocky slopes Dougl.
= var. floccularis Jepson n. var!

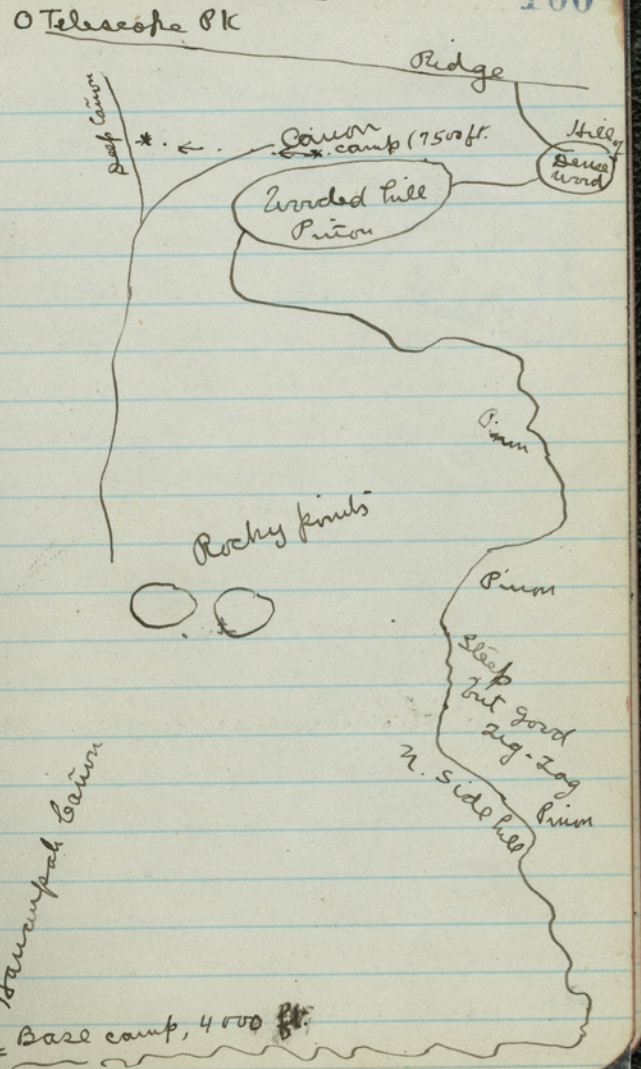
No. ✓ 7000. Euphorbia albomarginata T. & G. Involl. lobes clear white with a red gland spot at base of each. Prostrate. Rocky slope

No. ✓ 7001. Salvia Dorrii ssp. argentea ~~carnosa Dougl.~~
8-12 in. h. Low bush. Rocky slope
Audibertia incana Bth. 5500 ft.

No. 7002. Cladium mariscus var. Californicum Wats.
This sedge grew in the moist bottom, 6 to 10 feet high! Very rank, making a regular jungle. Leaves 4 to 7 feet long.

No. ✓ 7003. Eriogonum saxatile Wats.
Also scattered high on rocky slope. Near base camp.

May 9, 1917.



Trail to Telescope Peak.

– We left the base camp in bottom of Hanaupah Canon and with two loaded burros took the trail up to the top of the ridge north. Thence by a faint old Indian trail to a high narrow valley immediately under the east slope of the peak itself. Here is a spring and we made camp. The Junipers come in about 500 lower than the Piñons. With the Piñons appears a predominant bush (Artemisia tri-dentata), say at about 6500 feet.

The "valley" referred to is small, being in form a good deal like the glacial valleys of the Sierras.

About the spring are dense clumps of an elder (Sambucus). As it is only just beginning to burst its winter buds it is indeterminable, at least here in the field. It is, in any event, the sign of a spring at this altitude, as Prosopis juliflora is at lower altitudes.

From the camp here we can see the important and extensive Charleston Mts. with the lofty Charleston Peak; the whole range indicated, altho at great distance, by extensive snow-fields. There is more to the Charleston Range than to the Panamints.

This is a truly fine camp spot, by a good rushing spring, in a grove of open juniper and piñon; a view over the Black Mts. to the Charleston Mts.; sufficiently high to have cold nights; with the squawk of the Mountain Quail by day and Poor-will's call at night.

Telescope Peak

Pinus monophylla

No.	Height.	Girth at – ft.
1	21 ft.	1 1/2 " ground.
2.	26 ft.	2 1/2 " 1 1/4 ft.
3.	28 ft (35 ft. broad).	1 1/2 " 2 ft.
4.	31 ft. (One lower limb spreads horizontally 19 ft.).	1 ft. 10 in at 1 ft.

Probably the tallest are not over 32 feet high.

The average growth is about 12 to 18 feet high. The stems give off wide-spreading or horizontal branches near the ground, or the axis breaks into several upright or spreading branches. In old trees the broad crown becomes thin, open, and somewhat oak-like

– basin above camp, 8000 ft., under east base Telescope Peak.

"Ceanothus cordulatus Kell. ! see p. 175.

Fraxinus (No. 7017)

Symphoricarpos

Just bursting its winter-buds, heavy tangle of it.

Acer glabrum Torr.

Abundant for the place, thickets of it in cañon bottom.

Pinus monophylla

– Astragalus oophorus Wats. No. 7005. Cont. from p. 173.

Telescope Peak

– Slopes about camp, 7500 ft.

Pinus monophylla

Ceanothus cuneatus Nutt,* 7000 to 8000 ft. 4 ft. h., twice as broad.

Artemisia tridentata, the predominant bush.

Juniperus utahensis.

Ephedra viridis

Common, 2 to 3 ft. h

Symphoricarpos,
1½ to 2½ ft. h.

Sambucus

Abnt spring, very white-barked; 6 to 8 feet high

Many-stemmed thicket.

* This may have been = C. greggii !!! – most probably was, C. greggii. See Coville Bot. Death Valley, p. 79. It seems very like C. cuneatus as it ranges west.

Juniperus utahensis Lemmon.

– Roundish shrubs, 6 to 10 feet high, as broad as broader than high, very bluntly and shortly pointed at top. (Cf. no. 7011.) to 18

Sometimes 14 feet high and 1¼ feet diameter at bottom. The average of the larger individuals is probably the figures just given. The smaller growth 6 to 10 feet high. Usually branch so low as to appear many-stemmed from the base. The result is a diameter at the ground of 2 to 3 feet, but this not as a single trunk but as several. Again there are frequently trunks, distinct at very ground but branching just above, ½ to 1 or 2 ft. diam.

The growth in general is arborescent as to size of trunks and branches, that is the adult stand is tree rather than shrub.

Cont. p. 178.

Telescope Peak

Camp east of, at 7500 ft. Inyo Co.

No. 7004. Astragalus moharvensis Wats.

Cor. purple, turning blue purple, the central white spot of banner (across which the veins run) unchanged. Keel wings equal, half the length of the banner. Trailing or decumbent.

See p. 170.

Jepson n. sp.

No. 7005. Astragalus jucundus

Cor. light purple, the keel surpassed by the conspicuous white or white-tipped wings. Banner notched, oblong, but with shoulders or rounded auricles at base. Decumbent. Pod inflated, brown-spotted.

No. 7006. Prunus fasciculata Gray.

Thorny very divaricate-branched shrub, frequent but not common on rocky slopes at 6000 feet.

Climbed today to the top of Telescope Peak, taking the trail up the slope through the Pinons to the right of camp; then up the ridge; then above the benches an old trail slants up the slope, loose with sliding rock, goes over the lateral spur and along the slope up to the ridge. Here the trail went on along the main ridge to Boldy; we turned and climbed to Telescope. The Pinons go to about 8000 feet; then, on the slope up which we came, there is a zone free of trees until the Limber Pine (Pinus flexilis) and Bristle-cone Pine (Pinus aristata) begin. The former came in first, but the latter is more numerous in individuals. On the west slope the growth was thinner, but on the steep east slope, immediately below the summit there is

Telescope Peak, Panamint Mts.

a truly fine stand of Pinus aristata. Some large trees are:

No. 1 — 40 ft. h.; 5 ft. diam at base.
No. 2 — 30 ft. h.; 6 ft. 1 in. diam at 3 ft.
No. 3, — 45 ft. h.; 4 ft. diam. at 4 ft.
No. 4. — 30 ft. h.; 6 ft. 3 in. diam at 4 ft.

Leanothus cordulatus occurred well up the slopes, to about 8500 or 9000 ft. in characteristic form, i.e. low, 1 to 2 feet high and 5 to 10 or 12 feet broad. cf. p. 170 ante.

The Limber pines begin at about 9000 feet, The Bristle-cone at 9500, thence to the very top.

Artemisia tridentata goes nearly to the top. Chamaebatiaria Millefolium occurs at about 9000 feet.

The Symphoricarpos (no. 7012) is probably the most abundant rose at the higher altitudes after Artemisia tridentata. In winter condition it appears very divaricate-branched at summit, and very

thorny, with the pointed branchlets having a tendency to slant backward or below the horizontal.

The first colony I saw high up the slope reminded me strongly of Mamodora spinescens, 7500 to 10000 ft.

The view from Telescope Peak is commanding. The Sierra Nevada, a long snowy abrupt wall bounding the desert on the west, claims the instant attention and prolonged admiration of the observer: Olancha; Sheep Mt.; Mt. Whitney with no snow on its high eastern face, so that at the great distance one misses it at first; Tyndall, etc. etc. stretching far northerly until lost in the haze. A snow-white mountain of symmetry northerly = ? the White Mts. The Charleston Mts. easterly lifting finely

Telescope Peak

Panamint Mts

and asserting competition with the Panamints. Pilot Knob, I make out southwards. Westerly I can see the Sierras curving southwesterly to enclose the San Joaquin Valley; whilst the Greenhorn Range presents a fine spectacle of a long snowy chain. The symmetrical Templeton Mts., just beyond Olancha, is small but I make it out.

The Pinus flexilis probably ends at about 9500 ft. Ceanothus cuneatus (see p. 171) ends at about 8000 or 8500 feet.

Panamint Valley lies immediately under us west. It stretches north and south a long distance. In its utter desolation it does not look as if had anything on Death Valley. The rather formidable Argus Range bounds it on the west.

Inyo Co.

No. 7007. Astragalus calycosus Torr.
Banner pale lavender, round-elliptic, notched. Keel purplish. Wings white or whitish, deeply cleft!!, twice as long as exserted portion of keel, and shorter than the banner. Decumbent. 7500 ft.
= A. calycosus Torr. as det'd for Fl. Bad.
– Juniperus utahensis Lemmon Cont. p. 172.
Of course the form of practically all of it is shrub form. Bark dark brown, shreddy, sometimes black, not noticeably red here.

No. 7008. Senecio douglasii DC.
Rocky slopes 4500 to 5500 feet.

No. 7009. Castilleia angustifolia G. Don.
High rocky slopes, common. Apparently the dwarf form of No. 6970. 6500 ft. alt. The tops are eaten by the chipmunks.

Telescope Peak

Panamint Mts. Inyo Co.

= Langloisia

No. 7010. Gilia punctata (Hel). Goodding

Looks a bit like Gilia Matthewsii.

Corolla nearly white,

its lobes rhomboidal-ovate, acute, the upper portion with parallel lines of dots. Each lobe with 2 shallow parallel channels below, each channel ending in a lunate yellow ridge. Each cor. lobe with a purple spot at base. 4500 ft. alt, May 14.

See p. 180. Hanaupah Canon.

= Langloisia punctata Goodding.

No. 7011. Juniperus osteosperma Little

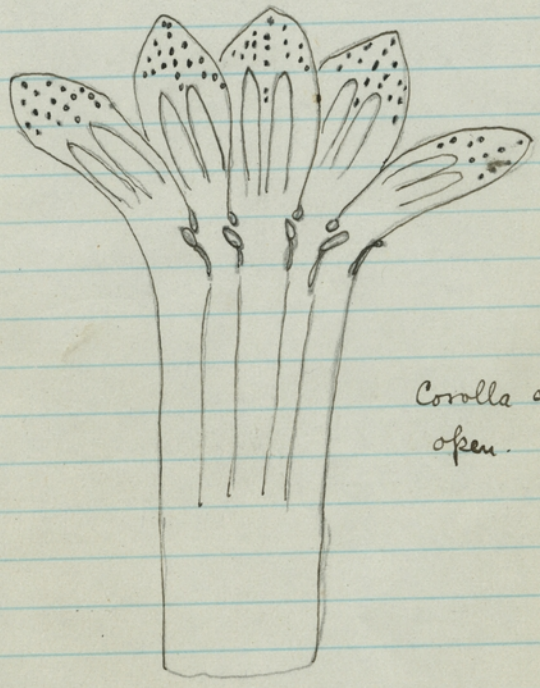
Bloom is worn off the berries. 6000 ft. alt. Cf. no. 6974.

No. 7012. Symphoricarpos.

1½ to 2½ feet high; mostly in thickets. See p. 175 freq. About Telescope Peak, 7000 to 10,000

May 13, 1917

- Bot. Gilia (Langloisia) punctata. No. 7010.



Corolla spread open.

This is a rarity here, but in a wet year it is probably common enough.

Telescope Peak, Panamint Mts.

No. 7013. Ephedra viridis Cov.
With many coarse heavy stems from base, 2 to 3 feet high. Aspect very yellow. Better to say several stems from base. 7500 ft.

No. 7014. Artemisia arbuscula ssp nova Ward ~~tridentata~~
Low, bushy, 8 to 12 inches high mostly; but many plants 1 1/4 feet high. Decidedly woody. 7000 to 8000 feet, perhaps much higher.

No. 7015. Artemisia Tridentata ssp. tridentata Beetle
Two to 3 or 3 1/2 feet high, with very much longer flowering stems than in preced. 7500 feet. Doubtless 4 ft h.

when in flowering state.

No. 7016. Lomatium parryi (Wats.) Gypsop
This umbellifer grew in cleft of the rocks on rocky slopes, 8000 to 8500 feet.

No. 7017. Fraxinus anomala Wats.
In wet spots on rocky slopes. Stems very white. 8000 ft.

No. 7018. Salix ~~of. lasiolepis~~ lutea Nutt. det. C.Sch.
Stems forming a thicket on low, i.e. near bottom of cañon, slope, moist spot. 5 to 7 feet high. 8000 feet.

= P. longiligula Scribn. & Williams

No. 7019. Poa ~~fendleriana Vasey~~.
This grass grew on a rocky slope, 8000 ft.

Telescope Peak

Panamint Mt.

No. 7020, Cercocarpus ledifolius Nutt. 4 ft. h. Only a few individuals noticed. 7500 feet.

No. 7021. Arenaria macradenia Wats. Rocky slope, 5000 feet.
See p.

No. 7022. Lesquerella kingii Wats. This crucifer grew on a rocky slope; moving shale soil, at about 8500 feet.

No. 7023. Pinus flexilis James. Telescope Peak, 9500 feet.
See p. 174.

No. 7024. Pinus aristata Engelm. Telescope Peak, 10,500 feet.
See p. 175.

Inyo Co. May 13, 1917

No. 7025. Chamaebatiaria Millefolium Maxim. 9000 feet. Steep rocky slope.

No. 7026. Juniperus occidentalis Hook. Trunk large, red, shreddy. In form and habit and appearance like the tree on the granite of the high Sierras. 9500 ft.

No. 7027. Ribes velutinum Greene Flowers yellow. Just beginning to flower; 10,000 feet.

No. 7028. Pinus monophylla Torr. & Frem. 7000 feet.

Hanaupah Cañon, Panamint Mts.

No. 7029. Gilia ~~terniflora Bth. var. sinuata~~ transmontana ~~(Dougl.) Jepson~~
Cor. white, tubular with rotate limb. Cor. buckskin color outside! Stamens inserted high, just below the sinuses. Five oblong yellow spots, faintly yellow below base of each lobe. Gravelly slopes.

No. 7030. Gilia filiformis Parry.
Cor. bellshaped, the lobes very deeply cleft, so that the proper tube is very short. Stamens inserted upon tube, their filaments incurving and anthers approximate about the style. Below the 5 apertures formed by the incurving filaments one sees 5 semi-transparent spots in base of cor. Cor. yellow; 2 parallel oblong faintly orange spots towards base of each lobe. Rocky slopes. Stamens little over half length of cor. Style with 3 broadly linear stigmas.

Inyo Co May 15, 1917. 4000 ft.

No. 7031
The expansion of the head in this Cichoriaceous plant is about 1/2 inch. Flowers yellow

No. 7032. Sisymbrium pinnatum Greene. = Descurainia pinnata
This crucifer with yellow flowers grew on gravelly - rocky slopes.

No. 7033. Atriplex canescens James.
Shrub 3 feet h. Rocky mesa.

No. 7034. Mirabilis Froebelii Greene.
Not in fl., but evidently a Nyctaginaceous plant. Wash.

No. 7035. Notholaena parryi Eat. Det. C.C.H.
This fern grew in the crevice-shadow of a rock, south slope, i.e., south of cañon bottom, more properly north slope.

Hanaupah Canon, Panamint Mts. Inyo Co.

May 15, 1917

4300 ft.

- Oenothera (cont. no. 6963).
Cor. white, fading pink. Pets. obcordate, the median line as it were ridged by the shallow cupping or concave condition of each side of the central longitudinal line.

- No. 7036. Pellaea ornithopus Hook. Det: C.C. Hall.
This fern grew under a rock.

- No. 7037. Pericome caudata Gray.
The dead stems of last year stood 4 to 5 ft. h. in a thick cluster. The new shoots were coming up thickly from the very base. Rocky slope but a moist spot.

- No. 7038. Rhus trilobata Nutt.
A straggly bush, 5 to 7 feet h., in the shadow of a cliff.

- No. 7039. Ericameria
Many-stemmed bush. Rocky canon. 1 1/4 feet high.

- No. 7040. Physaocarpus laciniatus var. eremicola Jepson.
Only a single individual seen. Rocky slope.

- No. 7041. (Stenotus) Haplopappus linearifolius var. interior (Cov.) Jones
Rocky slope. Rays 8, 8, 8, 8, 8.

- No. 7042. Pleuraphis jamesii Torr. = Hilaria
This grass on the broad flat back of a ridge. Det. A.S.H.

- No. 7043. Amsinckia tessellata Gray. Det. McBride.
Stinging bristly. Rocky slope.

Hanaupah Cañon, Panamint Mts

No. 7044. Plantago
Broad flat back of a rocky ridge

No. 7045. Chorizanthe watsonii T.&G.
Gravelly flat back of a ridge

No. 7046.
This composite grew on a rocky slope. Bushy, 10/12 ft. h. Note the pendulous heads.

No. 7047. Eriogonum hermannii Dur. & Hilg. var. sulcatum
Bushes, round, even, 1 to 1 3/4 ft. h. For even regular symmetry, almost as if mathematical, in its branching and outline this bush takes precedence of all desert bushes. Rocky slopes.

May 15, 1917 4500 ft. Inyo Co.

No. 7048. Peucedanum Parishii C.&R.
With 7045. (= Lomatium nevadense C. & R. var. parishii Jones).

No. 7049. Peucedanum Parishii C.&R.
With 7045.

No. 7050. Rectocarya setosa Gray.
With 7045.

No. 7051. Lepidium lasiocarpum Nutt.
With 7045.

No. 7052. Scrophularia californica
Foot of a tall cliff.

No. 7053. Arabis perennans Wats.
With 7045.

No. 7054. Tetradymia stenolepis Greene
With 7045. Bush 2 ft. h.

No. 7055. Eschscholtzia minutiflora Wats.

Rocky gravelly slopes. Yellow petals.

No. 7056. Gymnogramme triangularis (Kaulf.) ^

This fern grew under a great rock. North slope. Det. C.C.H.

No. 7057. Poa ohleyae Piper. = P. nervosa (Hook.) Vasey

This grass grew under the shadow of a great cliff, at its base. Det. A.S.H.

No. 7058. Rhus trilobata Nutt.

Straggly, 5 to 6 feet broad, 2 to 3 feet high. With 7045.

No. 7059. Emplectocladus fasciculatus Torr. (Cnemus fasciculata Gray).

Very thorny and rigidly and divaricately branched bush 4 to 6 feet high. Rocky slope. Widely scattered but not in thickets.

No. 7060. Phacelia pentyloides Gov.

This draped thickly a ledge of a cliff for some distance up. The capsule is 2-valved. The partitions bear axile placentae which are quite distinct. The first buds, which are just flower appearing, do not seem to be normal. The 5 petals are almost distinct or very lightly joined at base, with the 5 stamens very lightly attached to their base. Two of the petals are however, in one flower bud examined, joined nearly to the top of the claws. Style 2-cleft, (but one flower bud had 3 styles). Corolla white. See p. 2, vol. 34.

Hanaupah Canon, Panamint Mts.

- Left the camp at east base of Telescope Peak yesterday morning, May 13, and returned to the camp in Hanaupah Canon. Spent the afternoon drying out plants and cleaning up the camp. This morning went up the canon to the big spring, collecting in the canon and scouting over the slopes. This afternoon spent in writing up notes on plants and putting plants in press.

Dixon and McQuesten remained up above; they are coming down here to join me tomorrow, or possibly the next day. Today may not be the 14th as in a remote place I tend to lose accurate count of the days. [It is the 13th!].

May 14, 1917. 4000 ft. Inyo Co.

No. 7061. See below.

No. 7061a Lotus salsuginosus var. brevivexillus Greene.

This fleshy-leaved Lotus grew on a detrital fan in the finer shale. Cor. pale yellow. Banner very slightly notched. Wings emarginate at apex, longer than the keel and shorter than the banner. Stamens 9 + 1. Upper calyx teeth a little larger and slightly longer than the lower. Stems prostrate.

No. 7061. Lotus tomentellus Greene. with 7061a.

No. 7062. Nemacladus

Three upper lobes ovate, acute, equal, white, brown-tipped apex. Lower lobes broadly linear, brown-tinted, white at apex. Stamens with filaments free at base, soon joined into a tube surrounding the style, the whole structure protruded through the sinus between the

Hanaupah Cañon, Panamint Mts.

lower lobes. Two upper filaments with glands, each gland consisting of a yellow filament bearing 3 cylinders, these cylinders clear or semi-transparent, parallel and pointing backward. Detrital fan. Fils. united above the middle; anthers distinct!

- Oenothera

No. 6976 cont. Raceme coiled, flowering as it unfolds, the flowering being secund physiologically, i.e. they are all turned to one side. Petals elliptic-ovate, somewhat cupped, spreading but not rotate as seen this morning, shortly clawed, fading red or red-brown. Gravelly or shale drifts or slopes. Style (that portion of throat of calyx) finely hispidulose. Cor. pure white! under side white on opening, soon pinkish!

Inyo Co. May 15. 1917. 4000 ft.

No. 7063. Chorizanthe brevicornu

Calyx white, its lobes short, rather less than 1/4 as long as the slender tube. Stamens as long as the tube but inserted at base. The description in the Flora of California should be more explicit on this point. Calyx lobes barely exserted, in anthesis, from the invol. tube. — Shale drift on detrital fan.

See p. 142.

- Mimulus Fremontii cont. No. 6956.

Cont. Purple spot on each side of throat below lateral sini, that is sini between lips. A purple line runs from throat out to middle of each lower lobe. Minute glandular short hairs over throat and out outer lobes

a short distance. The color markings are so variable that it is better in a diagnosis to express the fact of yellow and purple markings on throat of lower lip in general terms.

~~n. sp.~~

No. 7064. Sphaeralcea ~~potchalla~~ Jepson ambigua Gray sep. monticola Kearn.
Stems numerous from the base, making a bushy plant 2 to 3 feet high. Very floriferous and in consequence very showy because the bright terra-cotta flowers are rather large. Stamen column very short, scarcely longer than the free portion of the fils. Ovary densely covered with a white felt. The corolla is a a deep apricot color. Perhaps that term better expresses it.

on hillslopes and washes. Ovules 2 in each cell.

No. 7065. Astragalus nuttalianus Ob.
Stems trailing. Cor. whitish with faint dull pink shadings. Wings, keel, banner subequal. Wings linear-oblong. Banner obscurely notched, mucronate. Stamens 9 & 1. Calyx-teeth subequal or equal, little shorter than corolla.

= M. laevis (Benth.) Curran

No. 7066 - Mirabilis californica Gray
1 to 1½ ft. h., very bushy. Calyx white, its lobes broadly notched. This is a species to puzzle a student in determining with a flora. The invol. is a perfect 5-toothed calyx in appearance, the calyx a colored cor.; but the calyx constricted over the ovary is seen not to be attached to it. But make provision in key. See p. 6, vol. 34

Hanaupah Cañon, Panamint Mts.

199

4000 ft.

Dwarfing

- This is a dry year in the Death Valley region and it is marvelous to observe the dwarfing of the annuals, where they appear at all. And yet if a favorable spot occurs the individual there will jump to normal size. For example Chorizanthe brevicornu so small that one can scarcely notice it, an inch high, — and yet I get bushy individuals 7 in. high. That it is a dry year is evidenced by the shrubs or bushes which make new growth far short of the now dead growth of last year. The white flowers of Mirabilis Californica shine thru a rampart of the dead twigs of last year.

May 15, 1917.

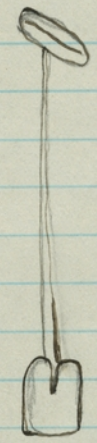
200

- Arenaria

No. 7021

Cont. Alternate filaments, i.e. those alternate with petals, with a dimidiate gland at base. Gland consisting of two short-cylindric papillae joined laterally 2/3 the way up. These glands are attached to the very base of the back of the filament.

?)



Petals broadly oblong, obtuse. Sepals ovate, acute, scarious-margined. Styles 3, very short, distinct.

No. 7067. Eschscholtzia Parishii Greene. with no. 6945

Nos. 7068 to 7075. Not used.

No. 7076. Gilia ~~sinuata Dougl.~~ malior Day + Grant with no. 6945. Lower part of Hanaupah Cañon

Hanaupah Cañon, May 15, 1917

-Cont. no. 6961. Bot. bal. key very poor as to this species. There is no contrasting character to "filaments all bearded at base" bottom p. 556. If the character of the sterile filament is constant as to hairiness, especially bearded at apex as in no. 6961, then this character should be used more freely or put into a more prominent position; and "stems woody" subordinated.

? P. Palmeri ?

Rocky washes and slopes. Stems numerous erect, straightish, from short main stems. Herbaceous.

-Lupinus excubitus Jones. no. 6950, I estimated one medium size bush as bearing 1150 spikes. The bush was circular and 7 ft. diam.

Panamint mts. 4000 ft.

- No. 7077. Mentzelia multiflora Gray. Wash. Stems several from the base nearly erect or ascending. Outer filaments, probably about 10 of them (but buds too young to determine accurately), with petaloid dilated filaments. = M. leucophylla T. Bdg.

- No. 7078. Vigneria laciniata Wats. This composite was very very common in the wash but grew on the rocky slope also. 2 to 4 ft. h. Woody only at base.

- No. 7079. Phacelia eremica Jepson. Wash. = P. cryptantha Greene.

- No. 7080. Agrostis ~~exarata Trin.~~ semiverticillata (Forsk.) C. Christ. (Det. B. Crampton, 1972) This grass grew in the wash.

Hogcamp Cañon, Panamint Mts. 4000 ft.
15 May '17.

Inyo Co.

No. 7081. Salix
fringe along stream at camp.
10 to 14 feet high.

No. 7082. Oryzopsis hymenoides Ricker
This grass grows on the rocky
slope. Det. A. S. H.

No. 7083. Plagiobothrys jonesii Gray.
Detrital fan.

No. 7084. Salazaria mexicana Torr.
2 to 3 ft. h. common on rocky
slopes.

No. 7085. (Discarded, insect damaged)
Eriodictyon.
2 to 3 ft. h. Rocky slope.

No. 7086. Chrysothamnus
1½ to 2 ft. h. + twice as broad
often. Intricately bushy, rounded.
Rocky slope.

483

Death Valley.

- Oscar Denton, Greenland Ranch, Ryan.
- Robert Weir, Skidoo, Cal.
- W. H. Faulkner, Supt. Lila C. Mine, Ryan.
- F.W. Corkhill, Death Valley Jct.
- Harry Gower, Commissary Clerk, Ryan.
- —— Sutton, Postmaster, Ryan.
- —— Putnam, Prospector.
- Arendt, U.S. '14, Engineer, Ryan
- Bill Boland, Panamint Indian, Furnace Creek Ranch.
- Panamint Jim, " " "
- Death Valley Scotty

Death Valley Species

- Calochortus flexuosus, Bigham Canon. Grapevine Mts
- Smilacina stellata, Willow Creek, Panamint Mts.
- Hesperocallis undulata. - "Amargosa Lily"?
- Sisyrinchium ~~hesperium~~ Bicknell Furnace Creek Canon
- Sarcobatus vermiculatus - bark white; lvs. usually glab.
  S. baileyi, bark dark gray; lvs usually pub; branchlets always spinescent.

207. Variation

1. Caused by mutilation. Atrichoseris platyphylla has a solitary scape, but most of my spurs show more than one due to mutilation, by cattle doubtless.
2. Plants should be taken from natural stations and not roadsides, disturbed lots, cultivated areas. See Harper's comments on this.
3. Dwarfing. Exceedingly small size of individuals. Vegetative parts mostly affected.

— Oscar Denton, Greenland Ranch, Ryan, California.

~~Pinus aristata 40 ft h~~
~~5 ft thin at base~~
~~branched low.~~

~~6 ft 1 in diam — 30 ft. h~~
~~4 ft diam at 4 ft — 45 ft h.~~
~~6 ft 3 in diam at 4 ft — 30 ft h~~

Chaparral
Shrubs with a single stem, die
Shrubs with many stems ~~are~~ ~~fe~~ never die.

Home Mem. –
Saunders, Rosilla
" Wishbone Bush
Nasturtium dictyota.

Camp List.
Mosquito Netting - never fail to take